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DIAGNOSIS OF ALLERGIC STATES IN SELECTEES*

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THE correct diagnosis and classification of allergic states in selectees have been difficult problems ever since the beginning of the induction-board examinations of the United States Army. Speed is a necessary component of these examinations, and the Army physicians have not always had such unlimited time, comparatively, in which to elicit and record an accurate history as their civil colleagues usually have. Furthermore, both positive and negative malingerers are occasionally seen, still further adding to the diagnostic difficulties. The examiner is therefore often faced with an unverified history of bronchial asthma and normal chest findings, but may be unable, in the limited time, to arrive at a correct, definitive diagnosis. Moreover, in a proved allergic case, it is often difficult to decide whether the condition is severe enough to warrant rejection for full military service.

In view of these diagnostic difficulties and with an eye to the future, a study of the allergic states has been made at the Boston Induction Station, with the hope that others may profit thereby.

Crandal,[1] in 1940, pointed out the gravity of the problem of allergy in the armed forces and the necessity for a complete history, and stressed the assistance expected of induction boards in eliminating the obvious cases, thereby lessening the load that would be placed on Army physicians in the subsequent treatment of men with mild cases who were accepted.

Regarding the desirability of disqualifying for general military service applicants with bronchial asthma of the mildest and most infrequent degree, evidence is available that such men are likely to be a source of future disability. In a recent paper, Andrus[2] points out the frequency of emphysema in men under forty in the Canadian Forces, with asthma as one of its presumptive causes. He notes that even candidates accepted for service because of good general condition and lack of, or nonadmission of, symptoms became respiratory casualties, with an unfavorable course and ultimate discharge; such men have a tendency toward frequent illness and relapse, and form a reservoir of compensation seekers.

It is known that the patient with respiratory allergy has a higher average incidence of residual illness after being subjected to the lung irritants of chemical warfare, and medical officers have been particularly impressed with this fact. The hypersensitive respiratory tract is more easily injured than the normal by any lung irritant, and an aggravated form of a previously mild asthma often occurs, with the eventual development of chronic bronchitis, bronchiectasis and emphysema.

Army regulations specify that chronic diseases discovered in the first six months of service should be considered as having existed prior to entry into military service, thus relieving the Government of allowing compensation in such cases. Mild, infrequent asthma often does not manifest itself in the first six months of service, since the precipitating influences of seasonal pollens or infection may not be present. Hence, there is more risk of compensation than in other conditions, such as orthopedic defects, peptic ulcers and psychopathic states, that usually manifest themselves earlier. It seems clear that the allergic states deserve serious regard when an applicant for the Army is being considered.

The allergic states were not clearly understood as one disease until Cooke and Vander Veer[3] showed that a large percentage of patients with asthma had histories of eczema, urticaria, angioneurotic edema and abnormal reactions to various foods. Therefore, all the older statistics, so far as the armed forces were concerned, refer only to bronchial asthma. Even with this lack, they show the importance of the problem in the past and furnish a basis for an estimate of the prevalence of

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disqualifying allergic disease. In the *Medical and Surgical History of the War of the Rebellion*,[4] it is reported that 4 men per thousand received medical attention for bronchial asthma while in service, and that 5 cases per ten thousand were of such severity that the men were discharged for this disability. Of the so-called "second million" drafted men examined at camps after May 1, 1918, 2.2 per thousand were rejected for asthma.[5] *Medical and Casualty Statistics*,[6] which gives the total figures for World War I, lists 1.9 per thousand as discharged from the Army for disability from asthma, and a total of 4.1 per thousand either rejected on induction or discharged for this condition. A national health survey,[7] covering the years 1935–1936, estimated that 1.4 persons per thousand are annually disabled for a week or longer by asthma or hay fever. All these figures are in very close agreement.

It seems practical to consider the 1918 draft-examination figure as most closely corresponding to the present situation. Since allergic dermatoses and other allergic states are not included, however, the true incidence of all allergic diseases is probably much higher.

Table 1. *Results of Examinations.*

Period	No. of Examinations	No. of Rejections*	Percentages of Rejections	No. of Rejections for Allergic Conditions	Percentage of Rejections for Allergic Conditions
First (previous complete local-board examination)	18,707	3303	16	73	0.4
Second (preinduction examination, with some previously examined by local boards)	16,819	6862	40	86	0.5
Third (no previous local-board examination)	8984	3595	40	81	0.9

*Figure includes men qualified for limited military service.

Examinations at Boston Induction Station

Examinations at this station were conducted by a team of civilian specialists. The standards followed were those prescribed in MR 1-9,[8] which specify:

Class 1-A (qualified for general military service): May include cases of hay fever, unless severe, and of acute eczema.

Class 1-B (qualified only for limited military service): May include severe cases of hay fever; mild cases of chronic asthma that have not prevented the registrants from successfully following vocations in civil life.

Class 4 (disqualified for military service): Includes cases of chronic asthma associated with chronic bronchitis and emphysema, except as stated above, and of allergic dermatosis, if severe and not easily remediable.

Because these standards allow the acceptance of mild and moderate hay fever, mild allergic dermatosis and acute eczema, a large number of those suffering from allergic conditions are acceptable for general military service. Furthermore, Class 1-*B* provides for cases that are severe enough to be a liability in general military service but can at some time be of use in selected phases of military life, as they are in civil life.

Three examination periods were covered in this study (Table 1). The first, from November 17, 1940, to October 20, 1941, was the entire extent of induction-board examination of selectees who had had a previous complete physical examination by their local-board physicians. The second, from October 20, 1941, to March 15, 1942, covered preinduction examinations in which only part of the registrants had been examined previously by the local boards and in which they were returned to their homes for from thirty to fifty days before being called to camp, a tentative rejection for special diagnostic investigation being thus allowed. The third period consisted of one month under the so-called "single examination" induction system, in which no man had received a complete examination by the local board. During this period, the registrant was examined and, if accepted, sent to camp on the same day.

The method of arriving at the diagnosis was reviewed in the 73 cases rejected for allergic states in the first induction period to determine the number of cases presenting diagnostic difficulties, to arrive at definite diagnostic criteria, and to establish what special investigations and findings were of most value.

Owing to the intermittent manifestations of most allergic conditions, occurring perhaps for only short intervals or at seasons other than that during which the selectee was being examined, it was impossible to use the same criteria of diagnosis that one would employ in clinical practice, in which the patient usually comes for medical examination at the time symptoms are apparent: in practice, full reliance can be placed on the history, whereas in examination by induction boards, an unsubstantiated history alone is not adequate

cause for rejection, because of the possibility of various degrees of malingering or concealment of disability.

In the 73 men rejected for allergic states, the following findings were of diagnostic value:

There were 6 cases of eczema and allergic dermatosis. The abnormal skin condition was visible at the time of examination, and a history of its relation to specific provocative irritants was obtained. (No registrant gave a history of an allergic dermatosis that was not apparent at the time of examination.)

In the 4 severe cases of hay fever, there was visible evidence of nasal allergy at time of examination, and the severity was verified by history as disabling.

There were characteristic asthmatic chest signs on routine examination in 32 of the 63 cases of bronchial asthma.

The fact that 51 per cent of the selectees with bronchial asthma had definite sibilant rales on auscultation, and that in an additional 6 per cent such signs were found later during the same day, emphasizes the value of this type of examination. Although the paroxysms of bronchial asthma are, in most cases, of short duration, one forgets that it often takes weeks for the chest signs to disappear entirely and that, in many severe cases, the chest signs are seldom absent, owing to the presence of superimposed emphysema and chronic bronchitis or bronchiectasis.

TABLE 2. *Comparison of the Incidences of Other Abnormalities in the Allergic and Control Groups.*

ABNORMALITY	ALLERGIC GROUP	CONTROL GROUP
	%	%
Chronic sinusitis	10	0
Nasal polypi	6	0
Deviated septum, deformed nose, basal septal ridge, dislocated nasal cartilage, basal spur or defective hearing	15	18
Dorsal kyphosis, severe	4	1
Neuropsychiatric conditions	20	20
Sympathetic instability	4	1
Chest expansion (average)	6 cm.	6 cm.

In the remaining 31 cases of bronchial asthma, which at the time of examination showed no rales and in which the diagnosis was made by the internist on an apparently unequivocal history, the special examination or findings that were of assistance in substantiating this diagnosis were: re-examination of chest eliciting characteristic musical and sibilant rales, 6 cases; documented history, 2 cases; nasal allergy, 3 cases; allergic dermatosis, 3 cases; and eosinophil count over 5 per cent, 2 cases. Although the finding of nasal allergy or allergic dermatosis in a case of bronchial asthma is not positive verification of a suspicious history of asthma, it is evidence of an allergic state and hence may be considered at least partial substantiation. The same thing may be said, with certain reservations, of an elevated eosinophil count.

To determine the significance of other abnormalities found in the allergic group, the records were compared with a control group, made up of the 2 cases rejected following each case rejected for an allergic state (Table 2). Although the series is small (73 allergic conditions, 144 controls), certain tentative conclusions may be drawn.

Abnormalities of nose. The finding of sinusitis and nasal polypi should be considered tentatively at least as substantiating a history of an allergic condition. Although it is known that the occurrence of nasal sinusitis in bronchial asthma may be purely coincidental, the relation is so common that the error can be considered insignificant. Francis, quoted by Lord,[9] found nasal abnormalities in 14 per cent of his 442 cases of asthma, and Rackemann[10] states: "The clinical picture of asthma is not limited to the pulmonary symptoms. Lesions of the paranasal sinuses are part of it." That patients with sinusitis only rarely have asthma is, of course, well recognized. Other abnormalities of the nose and throat do not appear to be of significance in the diagnosis of allergic states.

Orthopedic abnormalities. Although more cases with marked dorsal kyphosis were recorded in the allergic group than in the control group, the number was far less than was expected. It is a fact that severe bronchial asthma in childhood produces more or less deformity of the thoracic structure. However, such defects were not sufficiently striking to be recorded by either orthopedist or internist in the rapid routine examination. Hence, a special examination of the thoracic structure may well be indicated in all cases giving a history of asthma, for although it might be expected that the chest expansion would be altered, this was not shown on routine examination.

Neuropsychiatric abnormalities. Although no quantitative and little qualitative difference could be found in the neuropsychiatric abnormalities in the two groups, the diagnosis of the allergic state was included as part of the neuropsychiatric diagnosis in 12 per cent of the 73 cases. Since the neuropsychiatric examinations were performed by a number of different examiners with very limited time at their disposal, the diagnostic criteria were not uniform. The method by which the neuropsychiatric diagnosis was made therefore requires clarification. Undoubtedly, what the psychiatrists had in mind was the psychosomatic component of allergic states. This psychiatric aspect has been referred to by others.[10]

X-ray findings. The chest roentgenogram was recorded as normal in all but one case of the allergic series, showing definitely that a negative finding does not rule out bronchial asthma. It was believed, however, that a greater number of positive findings of emphysema, pulmonary fibrosis, low fixed diaphragm and bronchiectasis should have been made in cases of long-standing, severe, bronchial asthma, that the routine examination was not giving sufficient information and that additional roentgenographic study was advisable. The 4-by-5-inch stereoscopic photoroentgenogram without grid in routine use gives an exaggeration of the lung markings at the bases that has to be minimized in interpretation. It may prove advisable to take 14-by-17-inch films in men with a history of long duration and severity.

Verification and detailed history. It is hard to conceive of a registrant with bronchial asthma of sufficient severity to warrant rejection who has not sought medical attention at some time; therefore, when such verification is easily available, it is often the most efficient method of substantiating the diagnosis. The statement from a reputable physician or clinic of having observed the patient in attacks of asthma was considered adequate to substantiate the history.

Obtaining a detailed allergic history, including the descriptions of attacks and all manifestations of allergy, is far different from merely hearing the registrant's statement that he has bronchial asthma. It is difficult to give such a history without an intimate subjective knowledge of the disease. For this reason, when other evidence was not easily available, the detailed history was relied on in a few cases; however, later study proved that the greatest advantage of the complete history was to determine the exact nature of the case so that a search could be made for whatever manifestations might be expected.

Eosinophil count. Although the eosinophil count is elevated in some parasitic conditions, in this locality they are sufficiently rare so that a count of 4 per cent or over is regarded as substantiating the allergic state, provided that no history of these parasitic and certain other conditions is obtained.[11] It has been shown by Baagöe[12] that the count may remain elevated one month after an attack—a fact that makes it exceedingly useful in diagnosis, especially in registrants with a history of an asthmatic attack within a few weeks but with no objective evidence of the disease.

Eosinophil counts were made in a small series of suspected cases and nonselected controls. In the control series (24 cases), no eosinophil count was over 3 per cent. The counts in 6 cases suspected of allergy and proved negative were less than 2 per cent. When eosinophil counts were made in the remaining 18 patients, disqualified because of allergic states, the counts were over 5 per cent in 5 (28 per cent).

First Series

Four selectees out of the 18,707 examined in the first period at the Boston Induction Station were discharged from camp on Certificate of Disability Discharge for bronchial asthma. This is not the total figure, since it does not include those examined in this and discharged in other corps areas, but it probably comprises roughly 50 per cent of the total. The records of these cases were reviewed. In none was there any history of allergy or respiratory abnormality. In only one were there findings that might have aided in a diagnosis of allergy. In that case, there was dorsal kyphosis, poor posture and a chest expansion of only 4 cm. This suggests that more specific questions should be asked to elicit a history of allergy and that more attention should be given to abnormal thoracic structures.

Diagnostic errors were apparently less frequent than might be expected in such rapid routine examinations. A few selectees who were rejected for bronchial asthma on the finding of sibilant and musical rales and a doubtful history later returned and were accepted. With the great number of acute respiratory conditions seen at some periods, such an error seems unavoidable but would be minimized by adherence to the present criteria and by following Paragraph 49*b* of MR 1–9, which states that Class 1-*A* may include cases of "acute bronchitis, providing acceptance is temporarily deferred until a final examination shows recovery without disqualifying sequelae." When this procedure is followed, roughly half return completely recovered; the rest continue to have chest signs over a period of months and are rejected for chronic bronchitis or bronchial asthma.

Rejection was considered in a few cases in which a verified history of childhood asthma was obtained, but with no symptoms in the previous five years. Such a history is inadequate proof of bronchial asthma, and is of such doubtful significance in adult life that disqualification appears unwarranted. In 2 cases in which a clinical diagnosis of bronchial asthma was made, the x-ray findings were those of moderately advanced pulmonary tuberculosis. Several selectees, believing that they had asthma, based on an isolated attack of "wheezing" several years previously for which they had sought medical attention, had been skin tested and instructed to avoid certain allergens. Such isolated attacks do not warrant a diagnosis of bronchial asthma.

No frank case of malingering of feigned allergy was discovered in the examinations of the first period, although several were suspected in which the allergy was proved; several cases were found, however, in the last examination period. Negative malingering was commoner. Three selectees, ignorant of the seriousness of the offense, concealed from the examiner the fact that they had had severe bronchial asthma when asked general questions concerning their past illnesses. Three selectees answered in the affirmative to all questions regarding allergic symptoms and were found to be nonallergic; all, however, were mentally deficient.

Second Series

Little information was gained in the second preinduction examination period, although 86 men were rejected for allergic conditions. This lack of information was largely due to the fact that doubtful cases could be classed as "tentative rejections" and requests made for such examinations and verification of history as were necessary for diagnosis. This removed the pressure of having to make a definite decision on the day of examination, and thereby eliminated the stimulus to investigate diagnostic criteria. Theoretically, this method should be extremely accurate because more study can be made of the cases. The results were illuminating, because none of the cases were

returned with any information that could not have been obtained on the day of examination.

In this period, a detailed study was made of the first 4000 selectees. Of this number, 18 were disqualified for allergic states; all were verified by history. Musical and sibilant rales were heard in 11 cases; 1 man had dorsal kyphosis and 3 had chronic sinusitis and nasal polypi. Neuropsychiatric substantiation was obtained in 1 case, and increased bronchial markings on x-ray study in 1 case. Seven tentative rejections (28 per cent) were made, with requests for verification of history, eosinophil counts and skin testing.

Third Period

With the knowledge gained in the first two periods, a study was made to determine the efficiency of the examinations in the first 68 cases in this period in which the registrant gave a history of bronchial asthma (Table 3). Of these, 58 were verified and the registrants rejected. Eight men were accepted, 3 because the condition had not been present for five years, and 5 because of the absence of any evidence of asthma at the time attacks were claimed or because of documentary evidence that the asthma did not exist. Two cases were proved to be recurrent acute anxiety states, and the men were consequently rejected.

TABLE 3. *Pertinent Findings in 58 Selectees Disqualified for Bronchial Asthma.*

FINDING	NO. OF CASES	PER CENT
Documentary history	28	48
Eczema	6	10
Sinusitis or verified history of sinusitis	7	12
Sibilant or musical rales on auscultation (either on examination or re-examination)	45	78
Thoracic structural abnormalities (dorsal kyphosis or increased anteroposterior dimensions on examination or re-examination)	20	35
X-ray abnormalities	6	10
Emphysema 2		
Pulmonary fibrosis 2		
Fixed low diaphragm 1		
Bronchiectasis 1		
Neuropsychiatric conditions (psychoneurosis with allergy or psychosomatic syndrome)	6	10

In all cases, a detailed history elicited an intimate subjective knowledge of the disease, and one or several of these pertinent findings were present. The findings in this series confirmed the conclusions arrived at previously and also showed that more special attention to chest roentgenograms and the thoracic structure demonstrated more significant abnormalities than had been seen on previous routine examinations. It could not be decided whether the discovery of malingering in 6 cases, in the last induction period, demonstrated error in the previous examinations or a general increase in attempted evasion of military service.

DISCUSSION

The diagnosis of allergic states by examining boards resolves itself into a detailed study of each case, presupposing an intimate knowledge on the part of the examiner of the many manifestations of these conditions, and the residua apparent during the intermissions between acute episodes.

Every registrant is asked whether he has ever had asthma, bronchitis or hay fever. His history form is inspected to see if he has mentioned these or other related conditions. If a history of bronchial asthma is elicited, especially careful attention is given to auscultation of the chest. If there has been an attack within three weeks, fleeting musical rales may frequently be expected. Many men with the history of an old severe asthma, but with no attacks within a few years, are found to have chronic asthmatic bronchitis and emphysema at all times.

The complete allergic history is carefully taken, with special attention to determine from the duration, frequency, severity and precipitating factors just what condition would be expected at the time of examination. In all cases of asthma, and especially if the story is one of a severe asthma in childhood, the chest contour must be carefully inspected for increased dorsal kyphosis, barrel chest and increased anteroposterior diameter. A note should be sent to the radiologist to give the chest film special attention and to take a 14-by-17-inch film, if necessary. In men with a history of attacks within two months, an eosinophil count should be requested if the diagnosis is not otherwise verified. The history should include a detailed account of all previous medical attention. This often points out the severity and disabling nature of the condition and also gives the sources from which a documented history may be obtained.

In all cases, the skin must be carefully inspected, especially the face, ears and elbows, for eczema, which is often present between asthmatic attacks. The skin should be stroked to test for dermographia. The results of the nose and throat examination should be noted, and the finding of nasal allergy, sinusitis or nasal polypi should be considered significant. All questions of purulent nasal discharge and chronic rhinitis should be solved by x-ray examination of the nasal sinuses. The results of the neuropsychiatric examination are studied, and the inclusion of the diagnosis of allergy as part of the neuropsychiatric diagnosis is considered substantial verification.

Conclusions

At the Boston Recruiting and Induction Station, 220 registrants out of 45,000 examined, or 0.5 per cent, were disqualified for general military service because of severe allergic states. This number compares closely with the known prevalence of these conditions in the general population of this age group.

The errors of the examination were considered. A known 4, and an estimated 8, selectees from the first 18,707 examined were discharged from camp for bronchial asthma within six months. In none of the 4 cases was a history of the condition obtained.

It is believed that even men with mild cases of asthma should be disqualified for general military service because of the probability of frequent illness, serious residua after subjection to chemical warfare, and greater risk of compensation.

Contrary to what might be expected, no information was gained in the preinduction period by the making of tentative rejections for further information and examination that could not have been gained on the day of examination.

It was found that an adequate diagnosis could be made from routine examination in only 60 per cent of the cases. This indicated the need for investigating what findings and examinations were of most value in substantiating the diagnosis; these include the presence of nasal sinusitis or nasal polypi, examination of the thoracic structure for dorsal kyphosis and an increased anteroposterior diameter, positive neuropsychiatric findings, positive chest findings on auscultation, a documented or verified allergic history and a high eosinophil count. The roentgenogram was of assistance in only from 2 to 10 per cent of cases, depending on whether it was a routine or special examination; hence, a normal chest film in no way eliminated bronchial asthma.

With the assistance of these findings, and by setting not too stringent criteria for diagnosis, an examining board will find little trouble in the diagnosis of allergic states.

References

1. Crandal, F. G., Jr. Allergy in military medicine. *Mil. Surgeon* **87**:337-352, 1940.
2. Andrus, P. M. Emphysema under forty: clinical and pathological significance. *Canad. M. A. J.* **44**:344-347, 1941.
3. Cooke, R. A., and Vander Veer, A. Human sensitization. *J. Immunol.* **1**:201-305, 1916.
4. *Medical and Surgical History of the War of the Rebellion (1861-5).* 6 vol. Washington, D. C.: Surgeon-General's Office, 1870-1888. Vol. 3. P. 729.
5. Britten, R. H., and Perrott, G. St. J. Summary of physical findings on men drafted in the World War. *Pub. Health Rep.* **56**:41-62, 1941.
6. *The Medical Department of the United States Army in the World War.* Vol. 15, pt. 2. *Medical and Casualty Statistics.* 1368 pp. Washington, D. C.: Government Printing Office, 1925.
7. Sickness and medical case survey. *National Health Survey, 1935-1936.* Bull. 1. Washington, D. C.: National Institute of Health, 1937.
8. *Standards of Physical Examination during Mobilization: Mobilization Regulations No. 1-9.* War Department, Washington, D. C., August 31, 1940.
9. Lord, F. T. *Diseases of the Bronchi, Lungs, and Pleura.* Second edition. 776 pp. Philadelphia: Lea and Febiger, 1925. P. 50.
10. Rackemann, F. M. Diseases of allergy. In Cecil's *Textbook of Medicine.* Fifth edition. 1744 pp. Philadelphia: W. B. Saunders Company, 1940. P. 553.
11. Kracke, R. R. *Diseases of the Blood and Atlas of Hematology with Clinical and Hematologic Descriptions of the Blood Diseases Including a Section on Technic and Terminology.* 532 pp. Philadelphia: J. B. Lippincott Co., 1937. P. 133.
12. Baagöe, K. H. Eosinophil cells in the blood of normal and of asthmatic children. *Am. J. Dis. Child.* **35**:171-185, 1928.

ASCORBIC ACID DEFICIENCY ASSOCIATED WITH GASTRIC LESIONS*

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IN recent publications, Lund, Crandon and Dill[1–3] have presented data concerning the relation of ascorbic acid to the healing of wounds. These data were secured by a study of patients whose wounds failed to heal. From these studies, conservative conclusions were drawn concerning the relative importance of ascorbic acid and various other factors (technical and chemical) as causes of failure of healing. The authors believed that, in the series studied, ascorbic acid deficiency caused fewer failures of healing than technical factors did. As a result of a similar study of cases with disrupted wounds, Hartzell, Winfield and Irwin[4] have taken the same conservative position, placing ascorbic acid deficiency among other factors as a possible cause of delayed or poor healing. Holman,[5] who studied routine surgical admissions, found that many patients had low blood plasma levels of ascorbic acid, but he did not state that disruption occurred in any of the particular cases studied. Bartlett, Jones and Ryan[6] showed that, in addition to low plasma ascorbic acid levels, many patients had abnormally low clearance curves in the plasma and low excretion in the urine after the administration of test doses. A recent paper by the same authors[7] presents experiments in which the tensile strength of healing tissues of animals and men were tested and the ascorbic acid content of the healing tissues determined. These studies show that low plasma levels are associated with low levels in the healing tissues, and that this, in turn, is associated with delayed healing. Wolfer and Hoebel[8] studied several cases of gastrointestinal carcinoma and other conditions. One patient without treatment was found to have a very low level of plasma ascorbic acid after evisceration. Other patients with low levels were treated, and no evisceration occurred. Ludden, Flexner and Wright[9] found, in 23 cases with gastric lesions, that only 1 patient had a normal ascorbic acid reserve, and 1 had frank scurvy. They report that 7 gm. of ascorbic acid was necessary to saturate the latter patient. Hunt[10] studied the problem of vitamin C and healing in both experimental animals and man. A particularly interesting part of the study was that done on 28 patients who came to autopsy shortly after surgical operation. He found that in 8 there was microscopic evidence of failure of deposition of collagen in the wounds; 5 had disruption of the abdominal wounds, and 3 had leakage of anastomotic suture lines.

The present communication is concerned with data on a group of patients with gastric lesions. These cases are of especial interest because ascorbic acid deficiency is very common among them, not because of any direct metabolic effect of the disease, but purely because of deficient dietary intake of the vitamin. In this study, an attempt was made to estimate as closely as possible the tissue reserves of the vitamin. These reserves are what is probably important in the healing of the wound rather than the output in the urine or the amount in the blood plasma, both of which may be affected by changes much more rapidly than the reserves are. It was hoped that by focusing attention on the reserves a better understanding of the problem might be secured.

METHODS

Dietary history. Analysis of the patient's diet, one of the many ways of studying the ascorbic acid status, is available to any physician and needs no laboratory tests. Without such tests, however, it can give only part of the picture, but the part given is so important that even when laboratory tests are available it must not be omitted. For some time, there have been available complete tables giving fairly accurate analyses of the vitamin C content of all usual American foodstuffs.[11] By taking a dietary history and calculating from the tables, one may make a fair estimate of the vitamin C intake over as long a period as the history is reliable. It must be realized that studies for a day or two are of little value. What is needed are averages over long periods. Ralli et al.[12] have shown that, when diets are changed, the blood plasma level changes with them, and rather promptly becomes adjusted to the new level of intake, except that no increase in intake can cause a further rise in the level after the tissues and blood become saturated. From the length of time shown by Crandon, Lund and Dill[2] to be necessary for the de-

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velopment of scurvy in a healthy man, it is certain that the adjustment of the reserves to changes in the diet is much slower than the adjustment of the blood plasma level. In giving consideration to the dietary calculations, one must take account of the possible interference with intake caused by vomiting and the interference with absorption caused by diarrhea. There is also evidence that the needs of the system are increased in conditions causing increased metabolism, such as fever and hyperthyroidism. In this study, the dietary calculations were based on the average intake for one month prior to the first blood test. It is realized that a longer period of consideration would be helpful if there were marked variations in intake prior to a month, but it was found to be impractical to evaluate data that went back farther than this.

Blood plasma studies. If the patient is on a definite daily intake of vitamin C and is in a constant state so far as absorption and metabolism are concerned, a single plasma determination will give a fair index of the degree of saturation. Unfortunately, however, a very short period of reduced intake or increased utilization will affect the plasma level much more than it will affect the tissue reserves. A single determination showing a saturation level (about 1.0 mg. per 100 cc.) is all that is needed to prove that a patient's reserves are saturated, but a determination of 0.00 may be found in a person who has a 75 per cent reserve, and the same value may be found in a patient with scurvy.[2] A low value with high reserve may be due to illness, operation,[13] starvation or vitamin C deprivation of only two or three weeks' duration.

When a low value has been found, one can, however, determine how low the depletion in reserves is by replacing the vitamins and measuring the amount and time needed to achieve saturation. Two general types of saturation tests have been used in the past. In one, hourly determinations of the plasma level are made after a test dose of, usually, 1 gm.[14] The shape of the resulting curve indicates the degree of depletion. The other, and the one used in this study, is to give daily doses, usually 1 gm. each, and determine the level on the following mornings.[15] A true case of scurvy will need four to six doses before the patient shows a normal level in the morning.[2] If one finds, however, a saturation level on the second morning, one can be sure that the patient had half or more of his normal tissue reserves before the test began.

Vitamin C in white blood cells. Butler and Cushman[16] showed that the normal person with saturated vitamin C reserves has a level of 30 to 40 mg. per 100 gm. in the white blood cells. They, and Crandon, Lund and Dill,[2] have shown that this level drops off much more slowly on deprivation than the level in the plasma does. However, even this value does not always have a direct relation to the reserves, since the level reaches zero some time before the symptoms of scurvy appear. Values for the white cells were included in the data on a few of the cases in this paper.

Estimation of reserves. The estimate of ascorbic acid reserves is made on the basis of all the data available in each case. In all cases except Case 1, there was evidence of at least two of the following kinds: history, simple plasma determination, simple white-cell determination, and determination of plasma or white cells after test doses. When diet or simple plasma or white-cell determinations were the only data available, the reserve was taken at the level suggested by the one that indicated the position nearest to its normal. If determinations were made following test doses or treatments, the results of these tests were made the basis of the estimate, as follows: if the plasma value was found to be 1.0 mg. per 100 cc. the morning after a dose of 1.0 gm. of ascorbic acid, the value was entered as 75 per cent because, no matter what the original plasma determination showed, the reserve could not have been appreciably lower than this; on the other hand, if the plasma determination was still 0.0 mg. after three daily doses of 1.0 gm., the reserve was entered as 0. Other results were entered at intermediate levels depending on the best estimate of the reserve.

Data

Table 1 presents data on 18 patients with nonradical, elective operations for ulcers of the stomach and duodenum. The indications for operation were intractability to medical treatment, obstruction or bleeding or some combination of these. The first column in the table shows the usual dietary intake during the month prior to study. It should be noted that most of the cases had very low intakes. The second and third columns show the pretreatment plasma and white-cell values. The fourth shows the estimate of the reserves. In some cases, particularly Cases 3 and 9, higher values are given than can be directly estimated either from the diet or the plasma value. The estimate in such cases was made on the basis of a later saturation test that proved that neither the history nor the plasma value indicated the true situation. In general, whatever evidence indicated the higher value for the reserve was considered to be most nearly correct for a particular case. The fifth column indicates the amount of ascorbic acid given either by mouth or intrave-

nously prior to operation or up to four days after operation. The sixth shows the reserve established by the addition of this treatment to the prior reserve. The seventh column gives the type of operation, and the eighth shows the amount of ascorbic acid given subsequent to healing. The last column lists the result of the operation. The patient in Case 1 died the day after operation with symptoms suggestive of a cerebral hemorrhage. It is barely possible that the very low level of vitamin C may have contributed to his death. The patient in Case 12, which has been previously reported,[1] had a disruption due largely to scurvy. Case 17 was that of a man who had been vomiting for a long time and was in a particularly depleted condition in every way. He had so little vitamin C reserve that he was very close to scurvy. Although this deficiency was taken care of, it is possible that other deficiencies that were not corrected may have contributed to his death.

TABLE 1. *Data on Ascorbic Acid Reserves before and during Healing in Nonradical Operations for Gastric and Duodenal Ulcers.*

Case No.	Condition before Treatment: Ascorbic Acid in Diet	Plasma Ascorbic Acid	White-cell Ascorbic Acid	Ascorbic Acid Reserve	Preliminary Ascorbic Acid Treatment	Ascorbic Acid Reserve after Preliminary Treatment	Type of Operation	Subsequent Ascorbic Acid Treatment	Result of Operation
	mg./day	*mg./100 cc.*	*mg./100 gm.*	%	*gm.*	%		*gm.*	
1	1	0.15	—	15	0.0	10	Posterior gastroenterostomy	0.0	Cerebral hemorrhage; death.
2	100	0.74	—	100	0.0	100	Posterior gastroenterostomy	1.2	Recovery
3	2	0.00	—	20	2.4	40	Posterior gastroenterostomy	0.0	Recovery
4	5	0.13	—	15	1.6	40	Posterior gastroenterostomy	0.0	Recovery
5	40	0.62	—	60	0.0	60	Pyloroplasty	0.0	Recovery
6	5	0.11	—	10	0.6	25	Posterior gastroenterostomy	7.0	Recovery
7	10	0.10	—	10	0.0	10	Posterior gastroenterostomy	0.0	Recovery
8*	10	0.10	—	20	5.6	100	Jejunostomy	7.9	Recovery
9†	25	0.21	—	40	0.0	40	Posterior gastroenterostomy	0.0	Recovery
10	15	0.11	—	15	0.0	15	Excision of gastric ulcer	3.0	Recovery
11	5	0.30	—	30	4.0	100	Posterior gastroenterostomy	0.0	Recovery
12	5	0.00	3.0	10	0.0	10	Posterior gastroenterostomy	0.0	Disruption; recovery.
13	5	0.00	6.5	30	1.0	50	Posterior gastroenterostomy	4.0	Recovery
14	5	0.05	7.8	40	2.0	100	Posterior gastroenterostomy	0.0	Recovery
15‡	10	0.05	6.0	25	0.0	25	Posterior gastroenterostomy	4.0	Recovery
16§	15	0.01	4.2	25	4.0	100	Jejunostomy	0.0	Recovery
17	1	0.00	1.3	5	4.0	80	Jejunostomy	0.0	Peritonitis; death.
18	5	0.02	1.4	5	5.0	100	Posterior gastroenterostomy	0.0	Recovery

*Same as Case 7, Table 3.
†Same as Case 8, Table 3.
‡Same as Case 13, Table 2.
§Same as Case 12, Table 3.

Table 2 presents similar data on a group of 18 cases with ruptured gastric or duodenal ulcer. Necessarily, these patients were studied after operation. In a large number, including all but one that had complications, they were studied after complications arose. For this reason, the series is not a fair sample of the work in the hospital, and the high mortality of these cases is much higher than

TABLE 2. *Data on Postoperative Ascorbic Acid Reserves in Cases with Suture of a Ruptured Gastric or Duodenal Ulcer.*

Case No.	Postoperative Day of Study	Condition at Time of Study: Ascorbic Acid in Diet	Plasma Ascorbic Acid	White-cell Ascorbic Acid	Previous Ascorbic Acid Treatment	Ascorbic Acid Reserve	Subsequent Ascorbic Acid Treatment	Result of Operation
		mg./day	*mg./100 cc.*	*mg./100 gm.*	*gm.*	%	*gm.*	
1	1	25	0.30	—	0.0	50	0.0	Recovery
2	1	150	0.17	—	0.0	100	0.0	Recovery
3	10	—	0.12	—	0.0	10	2.0	Disruption; death.
4	1	8	0.10	—	0.0	10	0.0	Duodenal fistula; death.
5	1	7	0.10	—	0.0	10	0.0	Recovery
6	49	50	0.10	—	0.0	50	4.0	Pylephlebitis; death.
7	1	55	0.28	—	0.0	30	7.0	Recovery
8	14	—	0.19	—	0.0	30	5.0	Dehiscence; recovery.
9	21	45	0.12	—	0.0	50	0.6	Subphrenic abscess; recovery.
10	15	10	0.10	—	0.0	30	4.0	Peritonitis; death.
11	10	9	0.10	—	0.0	50	11.1	Disruption; recovery.
12	10	4	0.10	—	0.0	50	9.0	Dehiscence; death.
13*	11	10	0.05	6.0	0.0	25	4.0	Recovery
14	1	5	0.08	13.0	4.0	100	0.0	Recovery
15	1	10	0.07	4.0	0.0	20	0.0	Recovery

*Same as Case 15, Table 1.

the hospital average. The very low values for plasma ascorbic acid must be viewed in the light of the time the blood was taken. Both the operations[13] and the complications probably depressed these levels.

Table 3 shows data similarly arranged for 15 cases having major operations for the removal of benign gastric and duodenal lesions. It will be seen that more of these cases had fairly good vitamin C reserves prior to the immediate preoperative period and that many of the deficient cases were treated with ascorbic acid either just before or just after the operation. It should be noticed that 3 patients were studied only after complications had set in, ten, eight and ten days, respectively, after operation.

TABLE 3. *Data on Ascorbic Acid Reserves before Treatment and during Healing in Radical Operations for Gastric or Duodenal Ulcer.*

Case No.	Condition before Treatment: Ascorbic Acid in Diet	Plasma Ascorbic Acid	White-cell Ascorbic Acid	Ascorbic Acid Reserve	Preliminary Ascorbic Acid Treatment	Ascorbic Acid Reserve after Preliminary Treatment	Operation	Subsequent Ascorbic Acid Treatment	Result of Operation
	mg./day	*mg./100 cc.*	*mg./100 gm.*	%	*gm.*	%		*gm.*	
1*†	14	0.15	—	15	0.0	15	Right colectomy	0.0	Pneumonia; recovery.
2	—	0.34	—	35	0.0	35	Partial gastrectomy	0.0	Pneumonia; recovery.
3	—	0.38	—	40	0.0	40	Partial gastrectomy	2.1	Recovery
4	15	0.20	—	20	1.0	40	Partial gastrectomy	0.0	Leak; death.
5*	60	0.60	—	60	0.0	60	Partial gastrectomy	2.0	Pneumonia; recovery.
6	50	0.83	—	60	3.0	100	Partial gastrectomy	0.0	Peritonitis; death.
7‡	10	0.50	—	100	14.5	100	Partial gastrectomy	0.0	Leak; death.
8§	25	0.10	—	25	0.0	25	Partial gastrectomy	0.0	Recovery
9	60	—	—	60	6.4	100	Partial gastrectomy	5.5	Recovery
10	—	0.10	—	30	0.0	30	Partial gastrectomy	2.0	Recovery
11†	15	—	—	20	0.7	40	Partial gastrectomy	0.0	Pulmonary abscess; recovery.
12¶	15	0.00	4.2	25	7.4	100	Partial gastrectomy	1.6	Recovery
13	10	0.14	14.0	70	2.0	100	Partial gastrectomy	4.0	Disruption; recovery.
14	5	0.01	1.0	5	2.0	50	Partial gastrectomy	2.0	Recovery
15†	45	—	—	50	1.5	90	Partial gastrectomy	0.0	Disruption; recovery.

*Cases 1 and 5 are the same patient, who had a two-stage resection of a gastrojejunocolic fistula.
†Cases studied postoperatively.
‡Same as Case 8, Table 1.
§Same as Case 9, Table 1.
¶Same as Case 16, Table 1.

Discussion

Status of Ascorbic Acid Reserves Before Treatment

A total of forty-eight gastric operations were done on 43 patients. If one takes a conservative position in regard to diet by considering that a daily intake of 50 mg. should maintain a sufficient reserve for all purposes, the histories indicated that in only 7 of 43 patients was this level recorded. In 16 of 43 cases, the record showed a daily intake of less than 10 mg. However, in 5 of these, the history must have erred because other data showed higher reserves than such an intake would be likely to maintain. If one considers that a plasma level of 0.60 mg. per 100 cc. shows a reasonably saturated condition, it is evident that this level was found in only 4 of 31 cases (the cases with a ruptured gastric ulcer are not included because postoperative depressions of the value make direct comparison with the other cases impossible). Levels of less than 0.10 mg. were found ten times in the same number of operations. White-cell values were available in only a few of the cases. None showed a saturated level (30 mg. per 100 gm.), and 7 out of 13 patients gave evidence of a very depleted, but not necessarily scorbutic, state.

It is also clear that very few of the cases showed evidence of saturation before treatment. In fact, there were only 7 that rated at 60 per cent or above, and only 3 at 100 per cent. Eight cases were rated at 10 per cent or less.

Status of Reserves at Time of Healing

Early in the study, it was found that many cases with very low plasma levels healed properly in every way, so that no effort was made to have the condition corrected in all cases at once. Therefore, many cases that probably should have been treated with ascorbic acid were not. It will be seen from the "preliminary treatment" and the "reserves at time of study" columns that some cases were not treated, but that many were. The latter is particularly true in the cases with radical operations. It is also seen that, in many cases, treatment was started or continued after the primary healing period was over. This was especially so in the cases of ruptured ulcer with complications.

Importance of Reserves at Time of Healing

It is impossible to visualize systematic differences of results in accordance with differences in the

ascorbic acid reserves by inspection of the three tables already presented. However, Table 4 summarizes some of these data in a form in which they can be visualized. Everything is left out except the vitamin reserves *during the healing period* and the results. The cases are divided into three groups: those with reserves of 0 to 20 per cent, 25 to 50 per cent and 55 per cent and over. Results are also divided into three groups: recovery without complications, recovery after complications and death. The complications are all grouped together.

TABLE 4. *Complications and Deaths following Operations for Gastric or Duodenal Ulcer in Relation to Ascorbic Acid Reserves at the Time of Healing.*

SOURCE	RESERVES AT TIME OF HEALING	TOTAL NO. OF CASES	CASES WITHOUT COMPLICATIONS	CASES WITH NONFATAL COMPLICATIONS	DEATHS	PERCENTAGE OF COMPLICATIONS AND DEATHS	PERCENTAGE OF DEATHS
Table 1	0–20 per cent	4	2	1	1	50	25
	25–50 per cent	6	6	0	0	0	0
	55 per cent or over	8	7	0	1	13	13
	Total or average	18	15	1	2	6	11
Table 2	0–20 per cent	4	2	0	2	50	50
	25–50 per cent	9	3	3	3	67	33
	55 per cent or over	2	2	0	0	0	0
	Total or average	15	7	3	5	53	33
Tables 1 and 2	0–20 per cent	8	4	1	3	50	38
	25–50 per cent	15	9	3	3	40	20
	55 per cent or over	10	9	0	1	10	10
	Total or average	33	22	4	7	33	21
Table 3	0–20 per cent	1	0	1	0	100	0
	25–50 per cent	7	4	2	1	43	14
	50 per cent or over	7	2	3	2	63	25
	Total or average	15	6	6	3	40	20
Tables 1, 2 and 3	0–20 per cent	9	4	2	3	62	33
	25–50 per cent	22	13	5	4	41	18
	50 per cent or over	17	11	3	3	35	18
	Total or average	48	28	10	10	42	21

The most significant data in this table are found by comparison of the results (percentage of complications and deaths) derived from Tables 1 and 2 with the corresponding figures from Table 3. The number of cases is small, and conclusions derived from such a small series of cases must be guarded. There is, however, an apparent correlation between complications and deaths and low vitamin C reserves in the cases presented in Tables 1 and 2, but none in Table 3. What does this mean? Only a suggestion can be made. Such operations as closure of a ruptured ulcer and gastroenterostomy are so simple that technical errors are very unlikely. Therefore, if there are marked variations in the medical aspects of the cases, these variations rather than technical ones are likeliest to determine complications. On the other hand, the technical difficulties encountered in the major gastric resections were so frequent and so great that the variations, if any, resulting from the medical aspects of the cases did not show up.

It is well realized that it is dangerous to claim that diverse postoperative complications are in any way due to vitamin C deficiency. Lund and Crandon[3] have already presented data showing lack of correlation between vitamin C levels and the development of postoperative pneumonia. Others, however, especially Hunt,[10] have believed that many cases of postoperative peritonitis are due to failure of wound healing. It will be seen that all the complications of the cases listed in Tables 1 and 2 comprised complete disruption of the wound or peritonitis, which, in every case, could have resulted from failure of the gastrointestinal suture line to heal, except the complication in Case 1, Table 1. The data suggest that low vitamin C was a major complication of the remainder of the cases.

Vitamin Treatment of Surgical Cases

The vitamin treatment, if any, given these patients was usually limited to ascorbic acid, but in a few cases, one or more of the following vitamins were given: vitamin A, vitamin D, thiamine and niacin (nicotinic acid). All the cases of gastric resection had transfusions of at least 500 cc. of whole blood, and a few of the others received similar treatment.

The fact that, in many of these cases, no benefit can be shown to have resulted from vitamin treatment does not indicate that it was useless. The failure to demonstrate results may mean only that the treatment was "too little and too late." One

must not forget that most of the cases showing more than 50 per cent depletion below saturation of ascorbic acid may have had more serious, but unrecognized, deficiencies of other vitamins, minerals or even of types of protein. It is more than possible that some of these other deficiencies are more significant than that of ascorbic acid. As methods of study become available, they should be applied to such cases. In the meantime, the position taken by Holman[5] of giving large doses of all vitamins to all cases undergoing major surgery may be a wise one. It should also be remembered that, when vitamins are ordered, they should be given parenterally if there is any chance of poor absorption.

Conclusions

Very few of 45 patients who underwent operations for gastric lesions had a normal ascorbic acid intake, plasma level, white-cell level or reserve.

A few cases had such low reserves that they must have been very close to scurvy.

The greatest number of cases had from 20 to 50 per cent of normal reserves.

When nonradical operations were performed, more complications and deaths occurred in the patients with low reserves than in those with high reserves.

No more complications or deaths occurred in patients with low ascorbic acid reserves after radical gastric operations.

It is suggested that more and better vitamin treatment is indicated in cases coming to gastric surgery.

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References

1. Lund, C. C., and Crandon, J. H. Ascorbic acid and human wound healing. *Ann. Surg.* **114**:776-790, 1941.
2. Crandon, J. H., Lund, C. C., and Dill, D. B. Experimental human scurvy. *New Eng. J. Med.* **223**:353-369, 1940.
3. Lund, C. C., and Crandon, J. H. Human experimental scurvy and the relation of vitamin C deficiency to postoperative pneumonia and in wound healing. *J. A. M. A.* **116**:663-668, 1941.
4. Hartzell, J. B., Winfield, J. M., and Irwin, J. L. Plasma vitamin C and serum protein levels in wound disruption. *J. A. M. A.* **116**:669-674, 1941.
5. Holman, E. Vitamin and protein factors in pre-operative and post-operative care of the surgical patient. *Surg., Gynec. & Obst.* **70**:261-269, 1940.
6. Bartlett, M. K., Jones, C. M., and Ryan, A. E. Vitamin C studies on surgical patients. *Ann. Surg.* **111**:1-26, 1940.
7. *Idem.* Vitamin C and wound healing. I. Experimental wounds in guinea pigs. *New Eng. J. Med.* **226**:469-473, 1942. II. Ascorbic acid content and tensile strength of healing wounds in human beings. *Ibid.* **226**:474-481, 1942.
8. Wolfer, J. A., and Hoebel, F. C. The significance of cevitamic acid deficiency in surgical patients. *Surg., Gynec. & Obst.* **69**:745-755, 1939.
9. Ludden, J. B., Flexner, J., and Wright, I. S. Studies on ascorbic acid deficiency in gastric diseases: incidence, diagnosis and treatment. *Am. J. Digest. Dis. & Nutrition* **8**:249-252, 1941.
10. Hunt, A. H. The role of vitamin C in wound healing. *Brit. J. Surg.* **28**:436-461, 1941.
11. Daniel, E. P., and Munsell, H. E. *Vitamin Content of Foods.* Misc. Pub. No. 275, U. S. Dept. of Agriculture, Bureau of Home Economics. Washington, D. C., 1937.
12. Ralli, E. P., Friedman, G. J., and Sherry, S. Vitamin C requirement of man. Estimated after prolonged studies of the plasma concentration and daily excretion of vitamin C in 3 adults on controlled diets. *J. Clin. Investigation* **18**:705, 1939.
13. Lund, C. C. Effect of surgical operations on the level of cevitamic acid in the blood plasma. *New Eng. J. Med.* **221**:123-217, 1939.
14. Wright, A. S., Lilienfeld, A., and MacLenathen, E. Determination of vitamin C saturation: a five hour test after an intravenous test dose. *Arch. Int. Med.* **60**:264-271, 1937.
15. Portnoy, B., and Wilkinson, J. F. Vitamin C deficiency in peptic ulcer and haematemesis. *Brit. M. J.* **1**:554-560, 1938.
16. Butler, A. M., and Cushman, M. Distribution of ascorbic acid in the blood and its nutritional significance. *J. Clin. Investigation* **19**:459-467, 1940.

PRACTICAL PSYCHIATRY WITH ADOLESCENTS

III. Technic of Psychotherapy for the General Practitioner

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IN the first paper[1] of this series, a general discussion of the problems of the adolescent outlined various difficulties of adjustment met by the adolescent as he advances from late childhood to early adulthood, and the opportunity for help from the family physician was stressed. In the second paper,[2] a practical method for psychiatric examination was detailed, the minimal but necessary technical knowledge being explained. In this concluding paper, methods of psychotherapy and illustrative case histories are presented, so that the essentials for a mental-hygiene approach to these patients can be readily utilized.

The older child and the adolescent do not need excessive care in handling the many problems of adolescence; they can do most of the adjusting themselves. What they do need for the most part is understanding rather than actual help and, particularly, encouragement to seek and maintain an increasing independence of family. How unsuccessful an adolescent is in meeting his problems is expressed by his conduct, which is an exaggeration of behavior patterns formed in early childhood.

Personality reactions underlying adolescent behavior result in three general types: the paranoid, who believes that others always "pick" on him, resents correction, and is constantly dissatisfied; the introvert (schizoid), a shy, seclusive person who retires into daydreaming and fantasy formation; and the offensive patient, who is defiant, antisocial and the leader of rebellious groups, and who basically has a great deal in common with the paranoid. These types occur mildly at some time or other in all adolescents, but are pathologic when any one becomes marked and fixed in a certain person.

The commonest feeling resulting from unsuccessful adjustment is inferiority. Ordinarily, such feelings result from one or more of the following: an oversolicitous mother who prevents the child from "growing up" and hence makes him unable to hold his own in competition; a stern father who sets standards too high for the child to reach with any personal satisfaction of measuring up; physical defects magnified by overzealous parents and others; and relative mental dullness in a child who is made to compete with children of higher intelligence. Feelings of inferiority usually develop with adequate bases, whereas a so-called "inferiority complex" is an exaggerated degree of such feeling.

As described in the second paper of this series, the important investigative and diagnostic points may be enumerated as follows: neurotic traits; daydreaming and fantasy life; personal ambition; loves and attachments; secret fears and uncertainties; psychic trauma; sexual knowledge or misbeliefs, experiences and fears; intrafamily relations; and any symptoms of a psychosis. After determining the presence, quality and quantity of these traits, along with any other evidences of maladjustment, one is in a position to outline a plan of treatment.

METHODS OF TREATMENT

Explanation, reassurance and desensitization are the essential methods of direct psychotherapy so far as the general practitioner's training and time permit. This, of course, presupposes that he has gained the confidence of the adolescent and can act as a sort of father-confessor to him. The combination of the traditional "family physician" and modernization by training in psychology and psychotherapy is the ideal sought. One cannot tell these adolescents to "buck up," "forget it" or "cut out the kid stuff"; one cannot threaten them with reform school or insanity, or laugh at their often ridiculous beliefs concerning sex, methods of physical culture to become a strong man, fantasies of achieving renown and so forth. Instead, one must permit them to unburden completely, encouraged by gentle questioning and fortified by the absence of any disciplinary or condemnatory atmosphere. Later, the encouraging of self-discipline and of the recognition and acceptance of personal responsibility can be gradually inculcated.

When the whole story, or most of it, has been obtained from the patient, and the available outside history has been evaluated, the process of desensitization should be the next step. All experiences and ideas that have caused the adolescent acute shame, embarrassment, anxiety or fear should be calmly and completely explained; the patient

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should be particularly impressed with the fact that he is suffering the emotional "growing pains" subsequent to trying to discover himself as he rapidly matures. Pointing out evidences of the physical changes of puberty as coincidental physical "growing pains," the analogy being based on the fundamental unity of mind and body, is a good way to combine answers to both emotional and physical problems.

Explanation, reassurance and desensitization are direct methods of psychotherapy, but the indirect methods, such as a daily schedule of activities to fill up the adolescent's day, a modification of parental attitudes, and major or minor changes in school environment, are often as helpful.

The *daily schedule* should include school hours followed by an interval spent in a part-time job, athletics or group hobbies; evenings should be reserved for study and individual hobbies. Friday and Saturday evenings should be set aside for motion pictures, dances and parties, Saturdays for part-time jobs and athletics or other outdoor activities (boy scouts, hikes, nature clubs and so forth) and Sundays for church attendance and outdoor activities or quiet social groups at home. Idleness and loafing rather quickly foster restlessness and dissatisfaction, loss of interest and initiative toward the future, and even frank delinquency.

Hobbies should be of indoor and outdoor, and of individual and group types. Indoor hobbies have the advantage of year-round availability, whereas outdoor hobbies are usually seasonal or at least partially dependent on the weather. Solitary hobbies are useful for the adolescent who is particularly restless and flighty, since they promote perseverance and concentration. Group hobbies afford social contacts that are primarily of common intellectual interest, but adequate overflow into less impersonal relations readily occurs. This type of hobby is well worth fostering in the shy adolescent who feels woefully inadequate but often can be drawn out; in others, the intellectual liaison is established, and then, gradually, the aura of friendship appears.

The adolescent should be encouraged into actively investigating the subject of hobbies; he should be given some good references[3–5] and should be encouraged to patronize the local library, Y. M. C. A., Boy Scouts and organized hobby groups. The following are more specific suggestions of hobbies:

Indoor:

Collecting — stamps, coins, autographs, minerals, semiprecious stones, Indian relics, curios of all types, antiques, art works and books.

Plants and animals (raising and training, or just pets).

Manual arts — woodworking, metal working, model making, leather working and weaving.

Fine arts — drawing, painting, engraving, sculpturing, music, literature and photography.

Entertainment — magic and sleight-of-hand, impersonations and fortune telling.

Sciences — astronomy, radio, chemistry and microscopy.

Outdoor:

Walking, hiking, camping, fishing, hunting, boating, exploring, sports, mineralogy and nature study.

Group:

Dramatics, hobby clubs, study groups, and actual work in organized charities.

Group activities should occupy a large part of the adolescent's time, since it is vital for him to learn how to get along with others. Although a continual round of group activities may keep him from learning the value of quiet concentration and serious thinking, in the absence of many group contacts there is the very serious danger that the patient may develop a shy, withdrawn, introverted personality that is conducive toward dementia praecox (schizophrenia). Extracurricular activities at school, — clubs, orchestra and debating and dramatic societies, — church social groups, special organizations such as the Y. M. C. A., Y. W. C. A., Boy and Girl Scouts and their junior divisions, and the National Guard or similar military organizations all utilize the physical and mental energy of the adolescent, besides socializing and maturing him.

Sports are almost a fetish in this country, at least from the competitive standpoint. The tendency is for the quickest and strongest, because they make up the "school team," to have all the advantages of organized sports. Recently, the insistence on intramural sports in which all the students get a chance to play the commoner sports with those of their own general skill has done much to democratize sports. As much accent should be placed on "durable" sports, such as tennis, golf and hiking, which the player can continue when he gets older, as on intensely group-competitive sports, such as football, baseball and basketball. Also, the competition should not outweigh the sheer fun and relaxation inherent in sports.

Keeping a *diary* is useful in selected cases to get a better understanding of the adolescent, who can often write about his troubles better than he can talk of them. One should rarely use this method in the very introspective adolescent, since it will make him more so and such patients are difficult in the first place. A compromise method is note-

taking, in which the adolescent jots down at odd moments the things that he considers most difficult for him to understand or seem to produce unusual emotional reactions.

Modifying the family situation[6] is necessary in practically every case, this procedure being omitted when the adolescent comes spontaneously and sometimes secretly so far as the family are concerned. Since the parents are usually the source of financial support, one must postpone fee expectation until the adolescent permits his parents to know that he is seeing a physician, or let the bill go indefinitely until he himself can pay. If the adolescent allows his parents to know, and in serious cases one may occasionally seek a secret conference with a parent, it is usually necessary to advise a modification of the parents' attitude toward the child. The parental attitude may have been condemnatory, prying, sarcastic, nagging or cold. The fault is seldom all on the adolescent's side; often, all he needs is a little wise neglect and absence of parental overattention.

A disconcerting fact, but one that does not negate the recommendations given above, is the observation that the parents are essential in preventing the development of criminally delinquent adolescents. The Gluecks[7–9] found that in 60 per cent of 500 young criminals and in 58 per cent of 500 delinquent women there was a background of broken homes. If a parent is abusive or domineering or alcoholic, the adolescent will have trouble adjusting himself, both because he is antagonistic to the immediate situation and because his personality has been scarred through childhood by the baneful influence of such a parent. If the family situation is unusually bad, it may be advisable to recommend a foster home or care by congenial relatives.[10] In planning the removal of the adolescent from the home, Rogers[11] points out that success will occur if the patient finds emotional security, a sense of acceptance and a relief from fierce sibling rivalry, and if his emotional ties to the parents are not strong. Rogers concisely charts the criteria for consideration in foster placement; although chiefly used in children, they are in a large measure applicable to adolescents.

The classic adolescent behavior of horseplay, loudness of speech, atrocious manners, airs of superiority and righteousness and constant criticism of everyone else is a trial to those about him but also an indication that he is a trial to himself. Much of this behavior is overcompensation and excessive assertiveness to bolster his feelings of uncertainty and inadequacy as rapid physical and emotional changes are occurring within him. Parents need reminding they were once quite as difficult, and that they should extend to the adolescent tolerance, not ridicule, patience, not instability, and leniency, not annoyed discipline. By their wise handling of the adolescent, they can minimize the resentment and rebellion too commonly found in this period of life. They can foster his social adjustment by acting as sympathetic counselors, not as meddlers or dictators.[12]

Garland[13] makes the following comments:

> Restrained and inarticulate, the adolescent no longer reveals his innermost thoughts at home and thus fails to benefit from the safety valve of a confidential relationship with the parent. . . . The parents have also their reticences. The father, even if he recognizes the desirability of it, cannot talk to this strapping and somewhat arrogant youth as that individual needs to be talked to, nor can the mother approach the daughter according to her needs.

The adolescent needs some kind of adult companionship that is free from family inhibitions: "It may frequently be the physician who can best serve as parent-substitute, and particularly the pediatrician, if he has dealt wisely with his patients during their childhood. In this terra nova of medical interest he has early staked his claim."[14] Parents may make the adolescent worse by dominating and overprotecting him; regardless of whether their children find them interesting or boring, companionable or indifferent, just or unjust, sooner or later the children will and should leave home.

Sex education should have been taken care of by the parents during the childhood years, but it is a wise rule to get from the adolescent his ideas on anatomy, physiology, coitus, pregnancy, childbirth and venereal disease. One should question closely but gently and should not be fooled by what is usually a superficial knowledge given in glib answers, for the investigator is frequently amazed at the half truths and gross ignorance of the adolescent, who depends on street talk for his sex education. A frank discussion of sex opens the way to a calm introduction of the often highly emotionally charged topic of masturbation, and provides an excellent opportunity to desensitize the adolescent on this matter. If the parents bring to the office an adolescent with a history of troubles about masturbation or what seems to be a homosexual situation, a safe and effective way to introduce the material is to tell the patient that when his parents were young anything about sex was considered scandalous, and that many parents get upset about such things and exaggerate them. As a rule, this approach makes the adolescent realize immediately that the physician is not the usual critical adult but an understanding person who does not automatically condemn him as an outcast or abnormal. The homosexual situation is usually found to be a harmless crush on an older person of the same sex, although the relation may

have been prolonged unwisely. If the adolescent has been caught in a homosexual act, he and the parents should be told that it is only a carry-over of sex curiosity and experimentation from childhood or a substitute expression of sex drive in a person whose sexual maturity has not yet reached an adult heterosexual stage. If the homosexual behavior persists or the adolescent is definitely effeminate — or masculine if the patient is a girl — in appearance and manner, he should be referred to a psychiatrist.

The most obvious obstacle during adolescence is the acquisition of heterosexual stability. It is in sexual matters that one has the most difficulty in getting an adequate history from the patient; it is a subject requiring great tact and patience, particularly with girls, and the information is often unobtainable until the emotional retention results in an explosion in a panic reaction or in a hysterical episode. Despite the so-called "frankness" of modern youth, the adolescent is often reluctant to admit that he is troubled about sexual matters. Thom[12] states, "By the time the psychiatrist sees the adolescent who is having conflicts over sex, the situation has usually become involved and invariably there has been considerable elaboration of incidents which in themselves were not particularly important." The family physician can head off the development of such conflicts if he is alert and able to devise means to have the adolescent come to him spontaneously and early in the trouble.

The stages that a person passes through before reaching healthy adult heterosexual development are as follows: an interest primarily in himself, accompanied by self-exploration and resulting in autoerotic practices common to all infants and young children; an interest in the differences between sexes, with some indiscriminate sex play and no preference for a particular sex, characteristic of childhood; an interest primarily in those of the same sex, characterized by "crushes" and hero worship, together with antagonism toward the opposite sex — these attitudes are found in early adolescence; and finally, in mid-adolescence, an interest in the opposite sex begins as "puppy love" and proceeds through late adolescence to adult heterosexual maturity.

The crushes and hero worship of early adolescence are evidences of transient homosexuality, which is unconscious and normal and seldom reaches overt expression, or of experimentation, if such activity occurs. When "puppy love" appears, the adolescent is usually well on his way to successful heterosexual adjustment. Should the unconscious homosexual stage be prolonged beyond the age of eighteen, some investigation is indicated, since superficial causes, such as inability to dance, fancied or actual ugliness of face or body and lack of suitable clothes, may be keeping the heterosexually inclined adolescent from taking the plunge into the social affairs necessary for contacts with the opposite sex. Aldrich and Aldrich[15] write as follows:

> If it were possible to keep to the perfect letter of our social regulations, youth would grow up without experiencing any sexual feeling at all until marriage, at which time they would be expected to adjust successfully to this complicated growth process . . . when the maturing child feels the normal quickening of his sexual life, memories of those early punishments (shamings and spankings for childhood sex play) come up to make him feel ashamed and guilty instead of giving him a basis for security and satisfaction in the growth of his ripening powers. An appreciation of sexual competency as a constructive asset is a high and difficult standard for children to attain in our inconsistent world.

Career ambition needs attention, not just actually to pick out the best suited for the particular adolescent but also to keep him interested in the future along with a reasonable amount of self-evaluation (physique, intelligence, any unusual ability, education, maturity and so forth) to keep at a minimum the wild selection of impractical careers so common in early adolescence. It is useless directly to dissuade the adolescent from a certain career goal, no matter how absurd or impossible it may be; however, by reviewing with him his assets and liabilities in reference to the desired goal and encouraging him to investigate the years of training needed, one can often get him to abandon or modify his immature ambition. Equally important is the procedure of leading him into serious and mature planning for his career selection when such a selection is in keeping with his abilities. The adolescent with average intelligence should take a high-school course that will be useful in office work and the trades, and should not spend his time on the classics of a college preparatory course and be left on graduation day with much impractical knowledge so far as getting a job in everyday life is concerned. One should impress on him the value of night school to further his education while he is supporting himself. Jobless youths are serious problems, and it requires real ingenuity to devise and find ways to keep these young folks occupied, to prevent delinquency and loss of self-respect. They should be urged to do charity work, attend almost any of the free courses that most cities offer, or investigate the NYA and CCC projects, as well as military service — anything to keep them busy. Many parents, and consequently their children, still have caste ideas concerning the "trades" in contrast to white-collar jobs, and may ignore valuable advice about the study of a trade.

Delinquency refers to antisocial behavior that is considered criminal, such as habitual stealing, destruction of property, vagabondage and running away, occurring in children under the age of sixteen in most states. As mentioned above, genuine psychopaths, of which true juvenile delinquents are but smaller editions, are very serious problems and should be referred to the psychiatrist.[16] Meanwhile, there is too great a tendency to label as a juvenile delinquent any youngster picked up by the police more than once. Too often, the child or adolescent has against him several minor charges that are reflections of obviously unhealthy environment — slum sections, broken homes, idleness, poverty — rather than vicious antisocial behavior from character defects. Thom[17] concisely outlines modern thought and trends concerning delinquency, and indicates the value of mental hygiene: "I believe that until mental hygiene can be reduced to such terms that it can be utilized in the everyday practice of parent, teacher, nurse, physician, probation officer and others concerned with the training and education of children, it will not serve a useful purpose. . . ." Much so-called "delinquency" needs only careful analysis of motives, the offsetting of such etiologic factors as poverty, disease and idleness, and the redirection of the adolescent into healthy activities (clubs, camps, sports, hobbies and recreation) under mature guidance of counselors, playground directors, "Big Brothers" and "Big Sisters," or similar mentors. Healy and Bronner[18] have reported most encouraging results in a series of 400 cases treated at the Judge Baker Guidance Clinic five to eight years before the follow-up survey. They record 81 per cent favorable results in nondelinquents, — that is, children with the less severe personality and behavior problems, — and 70 per cent favorable results in delinquents.

Feelings of inferiority may be inferred from the adolescent's behavior (aggressiveness, noisy conduct, shyness and aloofness), or the cause may be described by him as frail body, clumsiness, stupidity, inability to dance, acne, inadequate clothes and so forth. Each point can be handled by explanation, by reassurance and, particularly, by a reference to similar difficulties endured by other adolescents. Adolescents are often sensitive to wearing secondhand clothes, and should be allowed some new ones occasionally; at least the "Sunday best" outfit should not be a castoff. Often, the social and economic levels of the family may be sensitive points as the adolescent compares them with those of his friends and acquaintances. He may resent or feel ashamed of what he considers a class inferiority because of such factors as car, clothes, church affiliations, portion of town in which he lives, size of house and whether rented or owned, size of allowance, and social status as shown by clubs and societies in which his parents may or may not hold memberships. He should be desensitized to avoid snobbery, and the reading of appropriate biographies will promote a realistic sense of values.

Chronic invalidism or prolonged convalescence, as in acute or severe chronic rheumatic fever, pulmonary or bone tuberculosis, anterior poliomyelitis, chronic pyogenic osteomyelitis and amputations, presents a crying need for mental-hygiene precepts and psychotherapy. The ingenuity and patience of the physician are often taxed to keep these adolescents occupied, interested in daily life, cheerful, unselfish and free from self-pity. An attitude of gently humorous interest in their case and encouragement to follow several practical activities or hobbies will sustain these young folks for months. In the community, facilities may be available for interesting and instructive "visiting services," such as social work, teaching, occupational therapy and voluntary reading and games with invalids. At times, it may be necessary to advise care in a foster home[19] because of crowding or a severe personality clash between the invalid adolescent and some member of the household.

Consultation with the school authorities may be advisable when behavior or scholastic difficulties beset the patient. Again, one must use tact and often secrecy in such contacts; otherwise, the adolescent may believe that the physician is violating his confidence or is siding with the school. When the necessary history has been obtained from the school officials and the problems outlined, the physician should recommend indicated changes in school curriculum, suitable disciplinary methods and his own general plan for handling the situation directly with the patient.

In conference with the school authorities, one can often profitably suggest inclusion of sex-education material[20] in courses, such as biology, physiology, hygiene, physical education, sports and sociology. Personality clashes between teacher and adolescent should not be taken seriously provided investigation does not show the teacher to be a misfit. The adolescent must be quietly impressed with the reality that all through his life he will be under the authority of apparently disagreeable persons and must learn to "take it"; in addition, he should realize that the personal problems of the teacher, such as financial worries, emotional disturbances, family stresses, and physical and nervous fatigue, may be solely responsible for the irritability and antagonism he shows the adolescent. Teachers[21–23] notoriously consider the relatively aggressive child a behavior problem because of his nuisance value, whereas the shy, withdrawn child is praised. Unfortunately the former is by far the healthier personality. As pointed out above,

regarding the parents, it is often not the adolescent who needs all the guidance and correction: those in contact with him need considerable education in mental hygiene.

Marriage of an adolescent does not automatically make him an adult, no matter what the legal attitude may be. If the marriage is permitted to continue, both the adolescent or adolescents and the parents need help to smooth the personality adjustments necessary, particularly when there has been an elopement. The adolescents are grateful for advice concerning special adjustment and the question of pregnancy, and many nonmedical problems, such as living with parents, whether both adolescents should work, life insurance, and even budgeting and homemaking. In turn, the parents need desensitization to their "in-laws," and often must be restrained from seeking legal redress or disowning the adolescent when such actions solve nothing and only make the situation worse. Unfortunately, the physician's influence is seldom sought in such matters.

Contact with pornographic literature, a common experience in adolescence, varies from crude sketches and verses on sidewalks and toilet walls to "French postcards" and lewd cartoon books. That this is not a more serious problem is a compliment to the adolescent, or perhaps it is because he is desensitized by the prevalence of sex appeal in modern motion pictures, magazines and advertisements. The more overt occurrences respond to matter-of-fact discussion with those involved; one appeals frankly to reasonable standards of personal ethics and good taste, and makes specific efforts to locate and deal adequately with the adults who are supplying such material to the adolescents. Making a humiliating example of such youthful offenders or preaching with righteous indignation does little good.[24]

Dishonesty, including lying, cheating in examinations and stealing, should be handled in a similar manner. The motives for such conduct, of course, are important, since etiologic treatment is always best. Cheating may be based on attempts to maintain high grades or pass in school subjects demanded by parental ambition, or may be prompted by laziness or boredom. Stealing may be a means to obtain desired luxuries or money to buy favors and win attention from associates when inferiority or handicaps prevent satisfactory competition otherwise.

Since the adolescent must learn to adjust himself in community life, every possible community faculty should be employed to interest him and occupy his energies. Thus, the physician should keep in mind the availability of clubs, training projects, hobby groups and so forth.

Concerning psychotherapy in general, the following realistic evaluation of Kanner[25] is pertinent:

> For psychotherapy, regardless of dictionary definitions, is not a sectional procedure, a trick, a technique, or circumscribed method, a selected emphasis addressed to an unconscious, a complex or any other personified abstraction. Practical psychotherapy is the organized treatment of a person in trouble, uniquely adapted and readapted to a unique person and a unique situation. . . . Its ideal goal is the adjustment of all that is maladjusted in an individual child and his specific environment; its working endeavor is the adjustment of all that can be adjusted at a given moment. It steers clear both of Pollyanna sweetness and nihilistic bitterness. . . .

Case Histories

Case 1. C. D. F., a 19-year-old boy, reluctantly went to a psychiatrist with a complaint of constant fatigue and lack of energy. He was well developed and nourished, and had the physique of a football player. He left college in the second year to go to work, and had his own used-car business on a small scale but made a fair living. His complaints of fatigue, lack of energy and aching all over had been in evidence for years, and he did not recall ever feeling "pepped up." There were no hypochondriacal complaints, and he was humorously aware of the discrepancy between the complaint of fatigue and his strong physique. The history showed an extremely dominating, querulous, attention-craving father who was very successful in business, but who was a mass of hypochondriacal complaints and spent two or three months each year going from one health resort to another. The mother, an unusually pleasant person, understood the father and tried to offset the terrific tension that his presence constantly maintained in the household. This tension was so severe that the patient's younger brother (Case 2) also required psychiatric help. An older brother, after years of clashing with the father, had left home, and during 3 rather stormy years of trying to get settled with a job and a wife, had also needed psychiatric help. The patient had never taken an active interest in sports and never did much physical work. The social adjustment was good with adults but only fair with his colleagues, since his constant feeling of fatigue made it an effort to take part in dancing parties, swimming parties, picnics and so forth.

Treatment consisted in an insistence on a gradually increasing program of physical activity, including a Y. M. C. A. membership and joining a hiking club, which took the patient on cross-country hikes and amateur mountain climbing at least twice a month. The effect of his father's personality was explained, and the patient saw for the first time the whole situation so far as intra-family attitudes were concerned. With this insight, he said: "I think we are all fighting against the old man. He never went to college but has always said that he would give his boys a college education. As a matter of fact every darned one of us [3 boys, aged 24, 19 and 18] have quit college despite the old man's objections." This was exactly what had happened; the only son who had completely rebelled was the oldest, who had left home.

Case 2. D. R. F., an 18-year-old boy who was referred to the psychiatrist by his brother, C. D. F. (Case 1), was a slender, restless, obviously tense boy who talked rapidly. His story concerning the father's influence on the children

was essentially the same as that given by his brother, but he added: "The old man gets me down more than the others now, probably because I am the youngest. I am high strung like he is anyway, and he nags and criticizes me so much that I feel just no good."

The patient worked during the summer in a small store owned by the father, and enjoyed meeting people and serving them. Such work had given him a sense of self-confidence and made him feel useful. The father, in the meantime, regarded keeping the boy a clerk in the store as excellent discipline; the patient recognized this motive, and was somewhat amused by the fact that, instead of being disciplined and under the control of the father, he was actually in the best environment to get away from the constant feeling of insecurity that his father's influence thrust on him. The patient said that he was entering the second year of college but really wanted to go to work in some business in which he would have contact with people and give service. He stated that he was going to leave college about Christmas time, although he dreaded the scenes his father would put on when he heard the news. His next words were practically an exact quotation of what his brother had said during an interview: that the father felt inferior at not having gone to college and was obsessed with the idea of giving his children college educations.

From what his brother had been told, the patient had developed insight into his own nervousness, and treatment consisted chiefly in more explanation and a great deal of reassurance.

Case 3. H. L., a 16-year-old girl, was referred by a dermatologist after he had been told by the parents that the girl seemed very depressed. He was treating her for marked acne vulgaris of the face, neck and shoulders, and she had been referred to him by the family physician, whose efforts for several months had not helped the skin condition. The patient was very well developed and nourished, with good facial features, except that her nose was somewhat flattened; posture was good, and her carriage in walking was unusually good. There was marked acne over the face, with many areas of folliculitis and a moderate degree of scarring. She was in the junior year of high school and had active interests in basketball, dramatics and church activities. She did not care for dancing, and had not yet had any special love interests.

The patient admitted that her feelings of depression were due to sensitivity concerning her complexion. She frequently noticed people looking at her because of her skin condition, and the boys and girls at school sometimes teased her. She often cried to herself, particularly at night, and although she did not avoid group social contacts, she did not seek any more than went along with her school and church activities. She definitely avoided dates with boys.

Treatment consisted of reassurance and explanations for the acne; the patient was informed that glandular overactivity, which is so common during the adolescent period, was responsible and that the lesions would eventually regress. She was desensitized against awareness of people looking at her by the statement that her excellence of figure, carriage and poise were probably as much responsible for people noticing her as her poor complexion. It was suggested that her disinterest in dancing was based as much on her awareness of being a poor dancer as it was on her sensitivity about her face. She was advised to use every opportunity to dance, and the parents made arrangements for her to take lessons in ballroom dancing. Her life situation was formulated as follows. Since she was interested in business and secretarial work, and for the next 3 years her main job would be to finish high school and get a year of business college, she should point her main efforts in this direction. In the meantime, she was to improve her dancing and constantly keep in mind that, despite her temporarily poor complexion, her assets of physical attractiveness were unusually good, and that a year or so later, when her skin condition had subsided, she would be a very pretty if not beautiful girl. Incidentally, she was reassured by the psychiatrist and the dermatologist that whatever scarring remained could be removed by plastic surgery.

This particular case was properly handled all along the line, although the family physician was somewhat slow in referring the case to the dermatologist. The most important points in the psychotherapy were that the skin condition was an annoying human experience, and that the patient's physical attractiveness and personality were definitely superior and would not be particularly impaired by the facial blemish.

Case 4. N. C., an 18-year-old girl, had had practically constant nausea and frequent bouts of vomiting for 3 years, beginning shortly before an uncomplicated appendectomy. She had a brother 2 years her junior who was in the same class in school, and there was a good deal of rivalry between them. The patient's symptoms of nausea and vomiting were always aggravated by any change, such as that caused by visitors and trips. Once or twice, she had fainting episodes in school. For the previous 2 years, she had done practically nothing except go to school; she was waited on by her parents and was not even required to pick up her own clothes. Examination showed a very well-developed and well-nourished girl who was emotionally quite immature and talked and acted like a high-school freshman.

After the nervous origin of the nausea and vomiting had been explained, a program was outlined with the parents in which the girl was to assume an increasing number of duties and responsibilities about the home. She was made to care for her own room, do ordinary sewing, get breakfast and plan the other meals, and do all the marketing. There was no open rebellion at these tasks, probably because it was explained that she would not be permitted to enter college — where she had already been accepted — if she did not follow directions in detail. Within a month on such a program, there was a marked change in her general poise; the chatter and juvenile restlessness of the usual 14-year-old, which had been her general behavior, faded into the appearance of a fairly quiet and more or less serious girl of 18. She was beginning to take pride in the household responsibilities, experimented with new menus, and had done some original and inexpensive interior decorating in her own room. The symptoms of almost daily nausea and vomiting were quite stubborn, and it was another month before any particular change was noted; these symptoms slowly subsided within the next 6 months, and now occur only once in 2 or 3 weeks.

Case 5. G. J., a 19-year-old boy, was oversensitive and oversolicitous concerning his health, limited exercise to avoid fatigue, went to bed early each night to get at least 10 hours of sleep, was fussy about his diet and ate various types of popular "health foods." Throughout high school, he had frequent bouts of vomiting for which an organic basis was never found despite repeated examinations. The history of the vomiting spells showed definite association with nervous tension and a feeling of inferiority to his fellow students, both scholastically and so-

cially. He did well in his studies in his freshman year at college, and during the first half of the year there were no spells of vomiting. As the year progressed, however, the vomiting returned, and during the summer vacation, the family physician, concluding that the vomiting was functionally related to the school situation, recommended that the patient travel or work for a year and then return to school. The diagnosis was only partially right, since after the first few weeks of an office job, the vomiting returned, and the family physician referred the patient to a psychiatrist. Another symptom, insomnia, had developed, and in addition to his overconcern with his physical health, the patient felt he would lose his mind because he was not obtaining adequate sleep.

He had been reared on a farm, the youngest of four boys; the oldest brother had taken charge of the farm at the father's death. The other brothers imposed on the patient by giving him much more work and responsibility than his years warranted because he was very faithful, being the first one up in the morning and the last one to retire at night. He had therefore practically no normal late childhood and early adolescence from the standpoint of carefree play. The case was thoroughly reviewed with the family physician, and a program of psychotherapy and occupational therapy outlined. The chief points in psychotherapy consisted in reassurance about his health and particularly about the problem of sleep, and in the development of an insight regarding his excess of seriousness, conscientiousness, health consciousness, reserved attitude and self-criticism. Occupational therapy was directed toward hobbies of the group type, to foster social ease. After several months of membership in a hiking club and a photography club, the patient made several valuable friendships and acquired self-confidence in social situations. In the 2nd month of treatment (an hour interview once a week), the vomiting ceased and sleep improved; at the same time, he found his office job much less irksome. He returned to college and has made a very satisfactory adjustment; he is still inclined to be rather shy and a bit overcareful concerning his physical welfare, but his original condition is much improved.

Case 6. R. S., a 20-year-old high-school graduate, had been married for 2 years and had 1 child (aged 18 months). At the age of 14, this boy lost his left arm at the shoulder from an automobile accident. He was the older of 2 children and was always the mother's favorite; his disability increased the amount of attention from her, so that he became spoiled, sulky, demanding and self-pitying. He took no part in sports or hobbies; his parents gave him a car and plenty of money, and most of his time was spent on parties, drinking and racing around the countryside. His girl friends were of an inferior type socially and intellectually, obviously because he felt more comfortable in their presence and because his money and his car made a great impression. He eventually had to marry a girl because of pregnancy; she had only a sixth-grade education and worked as a waitress at a very inferior type of tavern. The boy's parents, after this episode, were amenable to reason, and realized that their oversolicitude had been to a great extent responsible for the boy's warped personality. He had never been taught to compensate for his physical handicap. The parents accepted the girl and at first had the couple live with them, but after the baby came they very wisely set them up in a home of their own.

The boy is still far from well adjusted but is trying to accept advice and responsibilities. Treatment consisted of explanation, reassurance, praise and criticism carefully blended, and a definite program of work, social contacts, hobbies and a continuation of his and his wife's education through planned reading and night school.

Case 7. H. C., an 18-year-old college freshman, had been getting drunk about once a month since the age of 15 and had been dismissed from two preparatory schools because of his drinking. He was very reserved and found that alcohol made him able to mix socially with comfort. He was the youngest of 4 children, all boys, and there was 8 years between him and the next older brother. The father was a West Point graduate, domineering, aggressive and a very successful businessman. There was considerable army tradition in the family; several ancestors and a brother were West Point graduates. The boy qualified for West Point and passed the entrance examinations, but was turned down because of defective vision. This was a great disappointment to him and also to his parents. The mother was a vivacious, attractive woman, of Spanish ancestry, and temperamentally the opposite of her husband; she had spoiled the boy in her efforts to soften the father's treatment of him. The college authorities had noted a gradual decrease in efficiency, withdrawal from social contacts and a facial expression of depression. The college physician found nothing organically wrong and entirely missed the psychiatric implications, so that the boy was sent home with a medical opinion suggesting that he was lazy and needed disciplining. This, of course, only made the father's attitude severer, and for a while he kept the boy home studying; as a result, the patient became more and more withdrawn and depressed. On two occasions, there was suggestive evidence that he had made suicidal attempts — the first by an overdose of codeine, and the second by illuminating gas. The boy would not admit these, but the mother was sufficiently alarmed to refer him to a psychiatrist.

The history given to the psychiatrist was almost classically that of a slowly developing schizophrenia, and the prognosis appeared poor. On examination, however, the psychiatrist noted that the boy, although appearing disinterested and apathetic, within a relatively short time made a very active transference to the physician and soon poured out his story. Another factor that made the prognosis much more hopeful and entirely changed the diagnosis was the significant observation by an attendant caring for the boy at home that when the parents were out of the house for several hours the patient turned on the radio, at times hummed or whistled in an alert, buoyant manner, and occasionally laughed quite cheerfully. At no time was there any evidence that this boy was malingering; it seemed that the father's presence was a dark cloud, which immediately overshadowed the boy's usual state of average adolescent spirits.

The boy gave the following story to the psychiatrist: "For a year and a half, I have lost all interest in things [the West Point disappointment occurred at about the time of the onset]. I had no more emotional reactions to anything. In college, I studied hard but gradually my concentration got worse. One night I spent from 8 p.m. to 4 a.m. going over one or two paragraphs without being able to understand or remember the contents [his marks in preparatory school had always been high and he had a superior intelligence]; this scared me. I quit school and went home by hitch hiking, but got drunk on the way [in a little town near his home, as though he sought alcoholic courage before facing his parents] and spent a night in jail. My father raised hell; he made me stay in all the time and study. He wouldn't let me see my girl

[the patient was in the middle of an intense love affair, of the usual idealistic, adolescent 'puppy love' variety], and I worried about another fellow taking her out. All I do is hang around the house, usually in my room. I don't care to see anyone, and I don't want to do anything but read or sleep." There were no hallucinations or delusions, ideas of reference or feelings of being controlled.

Therapy in this case was difficult and not very successful at first because he was kept at home. The parents tried to be co-operative, but the father considered the boy's symptoms "all a bunch of damned foolishness — all that boy needs is a few good beatings." The boy was given a great deal of freedom; the relaxation of restrictions at first seemed to help him, but he soon became quite reckless in behavior, winding up in jail for drunken driving. It was apparent that a return to personal freedom should be made more slowly and in a neutral environment, and he was therefore sent to a private sanatorium. It was subsequently learned that although the father gave the boy the freedom recommended by the psychiatrist he stood in the background and constantly glared his disapproval of the boy's actions and often muttered threats and curses under his breath. This attitude, of course, only made the patient more and more panicky, increasing his recklessness as he tried to get in as much fun as possible before the father clamped down on him again. The boy's adjustment in the sanatorium was excellent, and he rapidly developed insight into the emotional turmoil in which he had lived for about 2 years. After 6 months he returned home to approximately the same parental situation, but he was able to withstand the father without an open clash and also without building up a store of resentment. He re-entered college and is successfully completing his freshman year. It is quite possible that the 6 months of hospital care would have been unnecessary if the college physician had been able to get the boy's confidence and learn the whole story or had recognized that the boy was in an emotional turmoil and referred him to a psychiatrist.

Conclusions

An analysis of the problems of adolescence is presented, methods of psychotherapy are outlined, and appropriate case histories are discussed.

The adolescent must gain independence and freedom from parents; he must learn to take responsibility for himself and to some extent for others; he must learn the value of money; he must learn to live with others, to make a comfortable social adjustment and to respect the rights of others; and he must have a reasonable goal of successful adulthood regarding education, economic stability and psychosexual maturity.

Adolescents with chronic illnesses or crippling physical defects are especially in need of psychotherapeutic attention.

References

1. Sullivan, D. J., and Flanagan, N. B. Practical psychotherapy with adolescents: a brief survey of the field for the general practitioner. *New Eng. J. Med.* **221**:414-419, 1939.
2. Sullivan, D. J., and Billig, O. Practical psychiatry with adolescents: technique of psychiatric investigation for the general practitioner. *New Eng. J. Med.* **223**:1050-1053, 1940.
3. Collins, A. F. *How to Ride Your Hobby.* 298 pp. New York: D. Appleton-Century Company, 1938.
4. Lampland, R. *Hobbies for Everybody.* Sixth edition. 408 pp. New York: Harper & Bros., 1934.
5. Stieri, E. *The Book of Indoor Hobbies.* 430 pp. New York: McGraw-Hill Book Company, 1939.
6. Levy, D. M. Maternal overprotection. *Psychiatry* **4**:393-438, 1941.
7. Glueck, S., and Glueck, E. T. *Five Hundred Criminal Careers.* 365 pp. New York: Alfred A. Knopf, Inc., 1930.
8. *Idem. Five Hundred Delinquent Women.* 539 pp. New York: Alfred A. Knopf, Inc., 1934.
9. *Idem. Juvenile Delinquents Grown Up.* 330 pp. New York: Commonwealth Fund, 1940.
10. Sayles, M. B. *Substitute Parents: A Study of Foster Families.* 317 pp. New York: Commonwealth Fund, 1936.
11. Rogers, C. R. *The Clinical Treatment of the Problem Child.* 406 pp. Boston: Houghton Mifflin Company, 1939. P. 98.
12. Thom, D. A. *Normal Youth and Its Everyday Problems.* 368 pp. New York: D. Appleton-Century Company, 1936. P. 58.
13. Garland, J. Adolescence: a pediatric viewpoint. *Harvard Med. Alumni Bull.* **13**:92-97, 1939.
14. Editorial. Pediatrics looks at adolescence. *New Eng. J. Med.* **221**:396, 1939.
15. Aldrich, C. A., and Aldrich, M. M. *Babies are Human Beings: An Interpretation of Growth.* New York: MacMillan Company, 1938.
16. Chornyak, J. Some remarks on the diagnosis of the psychopathic delinquent. *Am. J. Psychiat.* **97**:1326-1340, 1941.
17. Thom, D. A. Delinquency. *New Eng. J. Med.* **222**:308-313, 1940.
18. Healy, W., and Bronner, A. *Treatment and What Happened Afterward: A study from the Judge Baker Guidance Center.* 54 pp. Boston: Alpine Press, 1939.
19. Ebert, V. B. Social services to children with rheumatic fever. *New Eng. J. Med.* **224**:634-638, 1941.
20. Gruenberg, B. C., and Kankonen, J. L. *High Schools and Sex Education.* Bull. No. 75, U. S. Public Health Service. Washington, D. C., 1939.
21. Wickman, E. K. *Teachers and Behavior Problems.* 40 pp. New York: Commonwealth Fund, 1938.
22. Ryan, W. *Mental Health Through Education.* 323 pp. New York: Commonwealth Fund, 1938.
23. Davis, J. E. *Play and Mental Health: Principles and practice for Teachers.* 202 pp. New York: A. S. Barnes & Co., 1938.
24. Curran, F. J. The adolescent and his emotional problems. *Dis. Nerv. System* **1**:144-152, 1940.
25. Kanner, L. Psychotherapy of children. *Virginia M. Monthly* **68**:498-501, 1941.

Erratum. In the paper "Deterioration of Milk by Bacterial Growth Under Refrigeration at 40°F.," by Frank E. Mott and Henry Mazer, in the July 30 issue of the *Journal*, three errors appear on page 174: the abbreviation "C." in line 21, column 2, and in the two subheadings in Table 2, should be changed to "F."

MEDICAL PROGRESS

KIDNEY DISEASE

REGINALD FITZ, M.D.*

BOSTON

TWO excellent reports on recent medical progress as it concerns renal disease have already been published in this year's series; both are by Dr. John H. Talbott,[1, 2] of the Massachusetts General Hospital. In one, he discusses modern tests for renal function and describes methods now being employed to investigate glomerular filtration and effective renal blood flow. To read of Diodrast and inulin clearance tests as they are now employed makes older clinicians like myself a trifle nostalgic. Thirty years ago, I spent the summer in Tübingen, working with Carl Schlayer. His researches were pointed in the direction of studying tubular and glomerular function, as a test for the one potassium iodide clearance, and for the other, lactose clearance being used. Smith[3] has now gone ahead much farther along this line, adopting for the same purpose a different iodine compound and a different sugar. His methods are being tried in different clinics and appear to offer interesting results. As an example of the kind of work going on with these methods, Dill, Isenhour, Cadden and Schaffer[4] have studied renal blood flow in the toxemias of pregnancy, concluding that the same fundamental vascular abnormality is responsible for hypertensive disease as for toxemia.

There is still debate regarding how much the rate of blood flow through the kidney is impaired by hypertension per se. Dock[5] has attempted to explore this angle of the renal problem by perfusion experiments. He believes that kidneys from patients with hypertension have vascular beds that are within the range of normal and that therefore renal arteriosclerosis is rarely a cause of hypertension, although he admits that this may be a secondary complication.

Talbott's second paper discusses what he terms "heterogeneous renal disorders." He describes a variety of unusual renal disorders that are of considerable interest to the man who may be more concerned with the clinical side of nephritis than with renal physiology.

The war has already brought to light two forms of kidney disease that have hitherto received no great attention. Gilligan and Blumgart[6] have discussed what is termed "march hemoglobinuria." This medical curiosity, no doubt, occurs much more frequently than is generally believed.

> Nine years ago a patient of mine, hitherto always able to exert himself without trouble, suddenly developed what appeared to be bloody urine after playing a game of squash. A few days later, the hematuria recurred under the same circumstances, and the patient consequently gave up such a violent form of exercise. Some time later, however, after a gentle outdoor run, he developed a third attack of what seemed to be painless hematuria. Complete urologic studies, including cystoscopy and retrograde pyelography, were made, with completely negative results. Since then, the patient has played golf and mixed doubles as he chose, with complete impunity. Many specimens of urine have been examined, and they always have been entirely normal. I suspect that the patient had an attack of so-called "march hemoglobinuria."

Gilligan and Blumgart have made an excellent clinical study of 3 such cases. Their article is worth reading not only for its informative value but also for the delightful manner in which it is presented. Briefly, the 3 cases were studied most meticulously in a variety of ways. The authors conclude that march hemoglobinuria is a form of paroxysmal hemoglobinuria already well described. It occurs in attacks in otherwise healthy persons, follows walking or running, and may have something to do with the mechanics of body posture. There are usually no symptoms or very slight symptoms with attacks. The paroxysms appear to be due to intravascular blood destruction rather than to any extrinsic cause, and no great amount of blood is destroyed at any one time. Spontaneous recovery is the rule.

This study has been presented at a very opportune time. Gilligan and Blumgart predict that this type of paroxysmal hemoglobinuria will soon attract much more attention than ever before because of the large number of young men who are engaged in the strenuous exertion of military training. During the next few months, therefore, other cases will doubtless be presented. The value of having the condition in mind and of differentiating it from more serious conditions leading to the passage of blood-colored urine is obvious.

In the *British Medical Journal*, two interesting papers[7, 8] described the peculiar renal changes that complicate severe crushing injuries. People so injured are likely to develop, in the course of a few days, a very striking renal lesion characterized

Reprints of articles in this series are not available for distribution, but the articles will be published in book form. The current volume is *Medical Progress: Annual, Vol. III, 1942* (Springfield, Illinois: Charles C Thomas Company, 1942. $5.00).

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clinically by generalized edema, oliguria, acidosis, a rise in the blood urea nitrogen, a retention of blood phosphorus and potassium and a fall in blood sodium and calcium. The prognosis is always uncertain. The fatal cases that have been examined have shown a degenerative lesion localized chiefly to the collecting tubules and not unlike the type of acute nephritis that may develop after improperly matched blood transfusions.

Knowledge concerning this disorder has developed very quickly. In the first place, as so often is true when something new in medicine appears to be uncovered, the condition has already been fairly well studied. It seems ironical that Minami,[9] in 1923, who seemingly was then a Japanese student working in Pick's laboratory in Berlin, should have been the first to publish a comprehensive review of the subject. It is clear, however, from this paper that during World War I the Germans were thoroughly familiar with the peculiar syndrome that may follow crushing injuries, although why no attention was paid to the matter by American and British officers is less certain.

During the present war, the British have again been impressed with the crush syndrome, and, through the use of methods that were not available to previous workers, have added much to knowledge concerning it. Several hypotheses regarding its cause have been presented. Robertson and Mathews[10] have given an explanation that now is generally accepted: a crushing accident interferes with the circulation in the affected parts, and there is considerable muscle damage. A substance called "myohemoglobin" is set free, is absorbed into the general circulation, and passes to the kidney. Glomerular activity is reduced by this foreign substance, and tubular flow is diminished. As a result, myohemoglobin is concentrated in the tubules, with the formation of casts. Thus, it seems probable that acute nephritis from crushing is due to mechanical obstruction by myohemoglobin and also, probably, to some other unidentified toxic substances that are formed.

Several forms of treatment have been developed. On the theory that the syndrome is due not only to the liberation of toxins from the crushed tissues but also, in part, to loss of blood constituents into the injured limbs, treatment with intermittent positive pressure has been attempted. The treatment of the infection or the gangrene that so often accompanies the crush has also been attempted by the use of various more or less radical surgical procedures on the theory that pressure in deep and badly injured muscle compartments may add to the damage to tissues. Alkalization and the intravenous injection of fluids in various forms — including, most recently, glucose in isotonic sodium sulfate solution — have been advocated. Adrenocortical hormone has been administered because of the high blood potassium levels frequently encountered. Of course, transfusion with whole blood, serum or plasma has often been used. The crush syndrome is so serious and its mortality is so high that careful clinical or experimental studies dealing with it may prove to be extremely valuable.

I can recall once having seen a patient in the Peter Bent Brigham Hospital whose legs were badly crushed in an automobile accident. I suspect that he developed the form of renal lesion that now so much interests the British medical officers, for within 48 hours after the accident, and for no apparent cause, the blood urea nitrogen was 61 mg. per 100 cc.

The patient developed a gas-bacillus infection, lost both legs, and later acquired an indolent, intractable anemia, which lasted for several weeks, a finding said to be characteristic of the crush syndrome. He is now alive and well.

Detailed reports of similar cases more carefully studied in civilian hospitals would be helpful in developing better methods for the treatment of this type of casualty. Unfortunately, so long as the war continues, the syndrome is likely to be encountered often, and certainly, as judged by the British experience up to date, it is serious. Husfeldt and Bjering[11] have demonstrated that civilian hospitals afford a chance to study a problem of this nature. A few cases carefully observed in the tranquil atmosphere of civil life might prove enlightening, and surely the problem of injury from crushing can be investigated in the laboratory by direct experimentation.

So far as the peacetime aspects of renal disease are concerned, the literature of the past year, as usual, contains many interesting articles. If one wishes to get a bird's-eye view of what surgeons are doing in the treatment of cardiorenal disease, a paper by deTakats et al.[12] is worth reading. Hypertension in certain cases can now be approached through surgery, provided that the correct diagnosis of the underlying cause is first established. Certain unilateral adrenal tumors, for example, may cause paroxysmal hypertension; the removal of a unilateral atrophic kidney also affords a means of curing hypertension in a strikingly dramatic fashion; attempts to revascularize the kidney by tissue implants appear to offer some hope of success; and even the treatment of hypertension by splanchnic-nerve resection is still under discussion.

Simeone[13] has published a very interesting paper, which deals with the intelligent use of fluids in the care of men with impaired renal function due to prostatic obstruction. He points out clearly how essential the proper use of fluids is, and he comments on the various changes in the blood chemical findings that may occur. If these changes are interpreted correctly, they help to point out the type of fluid that should be administered and also

indicate the results of the therapy that is being pursued. This is a well-written, clear and comprehensive paper.

Endocrinologists have begun to study the kidney seriously. Selye[14] has given an excellent review of the literature in this field and has added some experimental evidence of his own. He thinks it probable that the kidney is dependent for the maintenance of its normal structure on the balanced production of the growth and thyrotropic principles in addition to the effect of gonadotropic and adrenotropic hormones. Selye's paper is interesting to read, for if results obtained experimentally can be transferred to the clinic, it is easy to imagine many endocrinologic implications that might play a part in causing different forms of kidney disease.

To one who has heard the subject of nephrosis debated, a paper by Gilbert[15] is refreshing. As is well known, there are two schools of thought: one is that nephrosis is a separate entity from which patients either recover or during which they die of intercurrent infection; and the other is that nephrosis represents simply a stage in development of the pathologic process that ends in clinical and anatomic chronic glomerulonephritis. Those who worked under Dr. Henry A. Christian have absorbed the latter belief. Gilbert reports a typical case of nephrosis, observed carefully during a four-year period, in which the pathologic findings characteristic of chronic glomerulonephritis were finally demonstrated.

It seems interesting, too, that the much debated topic of the effect on hypertension of a high-protein diet should still be worthy of investigation. Yet Philipsborn, Katz and Rodbard[16] have once again demonstrated, this time on dogs, that these diets have no particular effect on the course of hypertension, although, of course, such diets may elevate the nonprotein elements of the blood nitrogen. At the moment, medical fashion appears to be in a phase of the cycle that is very far away from that of those days when the patient with hypertension was told, at all costs, to eat neither meat nor salt.

Anyone who has recognized hyperparathyroidism and has had the satisfaction of seeing a parathyroid adenoma removed will forever after maintain an interest in the intricacies of calcium metabolism. Andersen and Schlesinger[17] have described 2 new cases of renal hyperparathyroidism and summarized current views on this subject. They make the point that there is a difference in secondary hyperparathyroidism from kidney disease as it is seen in children and adults. In young persons, the underlying renal lesion is likely to be congenital, whereas in the adult it may be acquired and the result of pyelonephritis, glomerulonephritis or vascular disease. At all ages, the accompanying renal insufficiency is severe and chronic. At any age, in renal hyperparathyroidism, a moderate excess of vitamin D, at levels usually harmless, may produce hypercalcification of the bones and deposition of calcium in the tissues, including the media of the small arteries.

Besides its interest, another useful aspect of this paper is its bibliography. References are given to the first account of extirpation of a parathyroid adenoma as a means of treating osteitis fibrosa, to the literature dealing with hypertrophy of the parathyroid gland secondary to chronic renal insufficiency and, finally, to articles dealing with the close similarity between adult renal hyperparathyroidism and renal rickets.

* * *

As I have stated in previous years, I find it extremely difficult to write anything that approaches a complete report of current literature during a given interval on such an inclusive subject as renal disease. I have made no mention of the work going on with renin, on the effect of the sulfa drugs on the kidney or on many other aspects of kidney disease. Rather, I have tried to limit myself to comments on work, either old or new, that during the past twelve months has been of especial interest to my own tastes.

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References

1. Talbott, J. H. Renal-function tests. *New Eng. J. Med.* 226:197-201, 1942.
2. *Idem.* Heterogeneous renal disorders. *New Eng. J. Med.* 226:228-236, 1942.
3. Smith, H. W., Goldring, W., and Chasis, H. The measurement of the tubular excretory mass, effective blood flow and filtration rate in the normal human kidney. *J. Clin. Investigation* 17:263-278, 1938.
4. Dill, L. V., Isenhour, C. E., Cadden, J. F., and Schaffer, N. K. Glomerular filtration and renal blood flow in the toxemias of pregnancy. *Am. J. Obst. & Gynec.* 43:32-42, 1942.
5. Cox, A. J., Jr., and Dock, W. The capacity of the renal vascular bed in hypertension. *J. Exper. Med.* 74:167-175, 1941.
6. Gilligan, D. R., and Blumgart, H. L. March hemoglobinuria: studies of the clinical characteristics, blood metabolism and mechanism, with observations on 3 new cases, and review of literature. *Medicine* 20:341-395, 1941.
7. Bywaters, E. G. L., and Beall, D. Crush injuries with impairment of renal function. *Brit. M. J.* 1:427-432, 1941.
8. Beall, D., Bywaters, E. G. L., Belsey, R. H. R., and Miles, J. A. R. A case of crush injury with renal failure. *Brit. M. J.* 1:432-434, 1941.
9. Minami, S. Über Nierenveränderungen nach Verschüttung. *Virchows Arch. f. path. Anat.* 245:247-267, 1923.
10. Robertson, H. R., and Mathews, W. H. Crush syndrome. *Canad. M. A. J.* 46:116-120, 1942.
11. Husfeldt, E., and Bjering, T. Renal lesion from traumatic shock. *Acta med. Scandinav.* 91:279-291, 1937.
12. deTakats, G., Heyer, H. E., and Keeton, R. W. The surgical approach to hypertension. *J. A. M. A.* 118:501-507, 1942.
13. Simeone, F. A. The treatment of dehydration in patients with hypertrophy of the prostate, retention of urine and impairment of renal function. *New Eng. J. Med.* 225:299-304, 1941.
14. Selye, H. Effect of hypophysectomy on morphological appearance of kidney and on renotropic action of steroid hormones. *J. Urol.* 46:110-131, 1941.
15. Gilbert, G. C. Clinical lipoid nephrosis, with special reference to its transformation into clinical and pathologic chronic glomerulonephritis. *Arch. Int. Med.* 68:591-598, 1941.
16. Philipsborn, H., Katz, L. N., and Rodbard, S. The effect of high protein diets on experimental renal hypertension. *J. Exper. Med.* 74:591-600, 1941.
17. Andersen, D. H., and Schlesinger, E. R. Renal hyperparathyroidism with calcification of the arteries in infancy. *Am. J. Dis. Child* 63:102-125, 1942.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT

TRACY B. MALLORY, M.D., *Editor*

CASE 28331

PRESENTATION OF CASE

A sixty-five-year-old man was admitted to the hospital because of jaundice.

The patient had been well until seven weeks before admission, when he had a so-called "streptococcal throat" for a week. During this episode, he received a twenty-four-hour course of sulfanilamide. He never fully recovered his strength and, three weeks prior to admission, noted for the first time the onset of painless jaundice accompanied by light stools and dark urine. The degree of jaundice did not seem to fluctuate, and during the two weeks prior to admission he complained of an "itchy skin."

Six years before admission, an appendectomy was performed because of pain in the right flank; the appendix was said to have been normal. The patient was told at this time that he suffered with kidney trouble. He had no further urinary symptoms until three years before admission, when, following an attack of left-flank pain, he noted dark-red urine that persisted for several days. After examination of the urine, a physician told the patient that it contained blood. The past history was otherwise irrelevant.

Physical examination revealed a well-developed, deeply jaundiced man, who complained often of itching of the skin. The abdomen was soft, and there was no tenderness. No masses were felt. The liver edge was not palpable. Examination of the heart and lungs was negative.

The blood pressure was 148 systolic, 92 diastolic. The temperature was 98.6°F., the pulse 100, and the respirations 21.

Examination of the blood revealed 70 per cent hemoglobin and a white-cell count of 11,600 with a normal differential count. A blood Hinton reaction was unsatisfactory. The serum bilirubin was 4.75 mg. per 100 cc. direct and 6.75 mg. indirect. The nonprotein nitrogen was 44 mg. per 100 cc. Examination of the urine was negative except for a +++ test for bile, a rare red cell and an occasional white cell. The stool was guaiac negative. The prothrombin was 33 seconds (normal, 18 seconds).

A gastrointestinal series revealed considerable spasm of the antrum of the stomach. The duodenum showed no evidence of ulceration or constant pressure defect. A barium enema was negative. A flat film of the gall-bladder area showed no definite evidence of stone.

Operation was performed on the fifth hospital day.

DIFFERENTIAL DIAGNOSIS

DR. F. DENNETTE ADAMS: This patient was doubtless operated on for biliary-tract obstruction. The history is somewhat meager, and before proceeding with a discussion of the case, I shall ask Dr. Mallory to inspect the hospital record and see if answers to any of the following questions are available: Was there anorexia, nausea or vomiting shortly after the acute upper respiratory infection subsided? Did the patient receive any form of medication other than the sulfanilamide? Was the spleen palpable? What was the differential count? Was there fever after the respiratory infection subsided? What was the color of the stools?

DR. TRACY B. MALLORY: There seems to have been a very slight degree of anorexia. The spleen was not felt. The polymorphonuclear count ranged from 70 to 90 per cent; there were no abnormal cells. Up to the time of operation, the temperature was normal, and the respirations were constant at 20. The single stool examined was reported to be dark brown.

DR. ADAMS: Would it be fair to ask the roentgenologist some questions before proceeding?

DR. MALLORY: Yes, at any time.

DR. LAURENCE L. ROBBINS: The barium enema was said to be negative. The only films that show the liver and the spleen are these. Neither appears enlarged.

DR. ADAMS: Is there any enlargement of the gall bladder?

DR. ROBBINS: No.

DR. ADAMS: What about the kidneys?

DR. ROBBINS: The left kidney is normal, and I think the right kidney is also normal.

DR. WILLIAM B. BREED: The spasm of the antrum is of no significance?

DR. ROBBINS: Only of suggestive value. We see pylorospasm occasionally in cases of acute cholecystitis.

DR. BREED: Was there pylorospasm in this case?

DR. ROBBINS: That would be determined chiefly on fluoroscopy. However, there is narrowing of the antrum on all the films; this is indicative of some spasm.

DR. ADAMS: The fundamental problem in this case is to decide whether the jaundice was due to intrahepatic disease or to biliary-tract obstruction. With a sixty-six-year-old man with progressive

painless jaundice, one thinks immediately of obstruction due to carcinoma of the pancreas. Yet we have very little evidence on which to establish such a diagnosis. There were no preliminary digestive symptoms, no weakness and no loss of weight, which one often sees early with carcinoma of the pancreas. What is more important, neither the liver nor the gall bladder was shown to be enlarged clinically or roentgenologically, and no pressure defect of the duodenum was observed roentgenologically. Furthermore, the brown color of the stool rules out complete block. The only evidence in favor of obstruction is provided by the van den Bergh test: when, as in this case, the direct value is as high as 70 per cent of the total value, an obstructive type of jaundice is indicated. However, I always dislike basing a diagnosis on a single laboratory test when the clinical picture is not typical. I am further confused by the fact that the patient is reported clinically to have been deeply jaundiced, whereas the van den Bergh reaction indicates at most only moderate jaundice.

If the case were one of obstructive jaundice, carcinoma of the head of the pancreas would be most likely. There is certainly nothing to suggest the other common cause of obstruction — stone in the common duct. A remote possibility that deserves brief mention is that the obstruction might have been due to extension of a slowly growing tumor of the right kidney. We have no direct evidence, to be sure, but the two attacks of hematuria cannot be entirely disregarded.

What have we on the other side of the question? This patient was presumably perfectly well until he developed a streptococcal infection of the throat. That the infection was a fairly severe one might be postulated on the basis of the fact that he was given sulfanilamide. Following this illness, he was never entirely well, and four weeks after its onset the jaundice appeared. So-called "catarrhal jaundice" is often preceded by a respiratory infection, but usually appears within a few days — not after four weeks. Despite the interval, however, I cannot convince myself that the jaundice was not related to the infection, and that when the patient entered the hospital he was suffering from intrahepatic disease. Leukocytosis is not seen in simple catarrhal jaundice; yet it is not inconsistent with a severer form of toxic or infectious hepatitis that is proceeding toward acute yellow atrophy. That this stage of yellow atrophy had not been reached, however, is indicated by the absence of fever and other serious systemic signs. Occasionally, one encounters acute cholangitis secondary to severe streptococcal or pneumococcal infection, but this is not likely in this case because the patient was not sick enough, did not have a sufficiently elevated leukocyte count, and had no enlargement or tenderness of the liver. Could the jaundice have been related to the sulfanilamide? I doubt it, for if so, it would have appeared much sooner.

To summarize, there does not appear to be sufficient evidence on which to base a diagnosis, which is often true in cases of jaundice. As I said earlier, at first glance one would be suspicious of obstructive jaundice due most likely to carcinoma of the pancreas. But none of the expected or corroborative signs of biliary obstruction were present, and the illness started with a respiratory infection. Frankly, I am rather surprised that the surgeon was willing to explore so promptly. Had this patient been under my care on the medical service, I am certain — unless there were other facts available that do not appear in the record — that I should have pursued a course of watchful waiting for a week or ten days, treating the patient for acute intrahepatic disease and following the clinical course, particularly the progress of the jaundice. In the absence of any improvement, I should have recommended exploration, because of the impossibility of differentiating biliary obstruction and intrahepatic disease.

On the evidence available, my diagnosis is acute hepatitis following an acute upper respiratory infection.

Dr. Mallory: Could we have an opinion from the surgical side? Dr. Sweet, would you be inclined to explore this man?

Dr. Richard H. Sweet: I do not know. From what I have heard this morning, I should be inclined to agree with Dr. Adams. I should have wanted a little more study, especially about the relation between the evidence of obstruction and the van den Bergh reaction. The fact that there was apparently a dark-brown stool on one occasion seems to be slightly inconsistent. I might have studied that situation a little more.

Dr. Adams: Will the surgeon who operated on this man tell us why he operated so promptly?

Dr. Mallory: Unfortunately, he is not here.

Clinical Diagnoses

Adenocarcinoma of ampulla of Vater.
Pancreatitis.

Dr. Adams's Diagnosis

Acute hepatitis.

Anatomical Diagnoses

Papillary adenocarcinoma of ampulla of Vater.
Obstructive jaundice.
Operative wound: resection of duodenum and portion of head of pancreas, gastrojejunostomy and cholecystoduodenostomy.

Abscess of pancreas, with extension into retroperitoneal tissues.
Intrahepatic cholangitis.
Arteriosclerosis, moderate: aortic and coronary.

Pathological Discussion

Dr. Mallory: The patient was explored, with a preoperative diagnosis of obstructive jaundice. At operation, a small mass could be felt in the duodenum in the region of the ampulla. The head of the pancreas felt normal. The common bile duct was somewhat dilated and contained bile. It was believed that tumor was unquestionably present, either in the head of the pancreas or in the duodenum, and it was decided to do a block dissection. Accordingly, the stomach was divided in the antral region, and the duodenum was cut just before the ligament of Treitz. The common duct was divided, the pancreas was resected about a third of the way back from the head, and the entire block of tissue was removed in one piece. When it was opened, a slightly papillary and very slightly ulcerated tumor was found in the wall of the duodenum surrounding the ampulla of Vater. On microscopic examination, it proved to be a well-differentiated carcinoma, evidently primary in the ampulla. There was one regional node that showed metastases. Following operation, the patient began to run a septic temperature, and from that time on failed rather rapidly, dying in about two weeks.

At autopsy, extensive necrosis was found in the head of the pancreas. A large abscess had burrowed from the pancreas down into the right gutter. There was likewise a cholangitis, and some degree of hepatitis. It would not be possible to say from the autopsy findings whether the cholangitis and hepatitis had been present before operation. At any rate, there was no established biliary cirrhosis, although there was considerable infection in the bile ducts of the liver.

CASE 28332

Presentation of Case

A forty-one-year-old Syrian barber was admitted to the hospital because of recurrent attacks of vomiting.

The patient was well until five years before entry, when he suffered an illness lasting about ten days and characterized by nausea and vomiting. The night preceding the illness, the patient had eaten and drunk heavily. There was no fever, jaundice or other symptom. The trouble abated spontaneously, leaving the patient well until a year later, and again the year after that, when he experienced a similar illness, each period lasting ten days. Seven months before entry, the patient had a fourth attack of nausea and vomiting, this time preceded by a month of anorexia and slight weakness. He visited a community hospital, but returned home after a few days, his trouble having stopped. Anorexia, fatigue and some nausea remained. After a month, the vomiting recurred, following a roentgenologic examination of the gastrointestinal tract. This examination showed a "filling defect at the pylorus." The patient entered another community hospital, where he was given gastric lavage and intravenous feedings. After a week, he stopped vomiting. He was placed on an ulcer diet, and improved readily. In the next five months, he steadily lost weight (about 25 pounds in all) and suffered considerable nausea, with occasional vomiting. At times he had mild diarrhea. Ten days before entry, a final attack of severe vomiting began, persisting until the day he came to the hospital.

About twenty years before entry, the patient had a soft sore on the penis, lasting several weeks. Ten years later he had gonorrhea, with a residual stricture of the urethra that caused him persistent difficulty in starting his stream.

The family history was irrelevant.

On admission, the patient appeared chronically ill, emaciated and dehydrated. The pupils were wide and irregular, and reacted poorly to light and only slightly better to accommodation. The fundi were normal. The heart and lungs were not remarkable. The liver edge was palpable on inspiration, but was smooth and not tender. The urinary bladder rose to two fingerbreadths below the umbilicus. The prostate was twice the normal size and symmetrical, without palpable nodules. The reflexes were equal and active. Vibration sense was present, but position sense was impaired.

The blood pressure was 130 systolic, 85 diastolic. The temperature was 99°F., the pulse 85, and the respirations 20.

Examination of the urine showed a ++ test for albumin, and a sediment with 20 white cells and rare red cells per high-power field. The red-cell count was 7,600,000 with 14 gm. hemoglobin, and the white-cell count 14,700 with 68 per cent polymorphonuclears, 29 per cent lymphocytes and 3 per cent monocytes. The blood Hinton reaction was positive. The serum protein was 4.8 gm. per 100 cc., with an albumin-globulin ratio of 1:3. The nonprotein nitrogen was 26 mg. per 100 cc., and the van den Bergh reaction was normal; the phosphorus was 2.4 mg. per 100 cc., the phosphatase 3.1 Bodansky units, and the prothrombin time 25 seconds. Three stools were guaiac negative. Gastric aspiration produced 125 cc. of greenish, guaiac-negative fluid. A lumbar puncture showed clear fluid under normal pressure, with a cell count of 16 lymphocytes, a total protein of 32 mg.

per 100 cc., a + ammonium sulfate ring test, a positive Wassermann reaction and a gold-sol curve of 4332211000.

Roentgenographic examination of the upper gastrointestinal tract showed thickening of the folds of the stomach, with ready opening of the pylorus. The duodenal cap was rather small, and there was some narrowing at the junction of the first and second portions of the duodenum. After barium passed into the duodenum, it extended into an apparently dilated common duct, cystic duct, gall bladder, major hepatic ducts and some minor intrahepatic branch ducts. The first portion of the duodenum then showed irregular filling defects and two or possibly three fine fistulous tracts passing from this part of the duodenum to the gall bladder (Fig. 1). In re-examination on the following day, the fistulous tracts failed to fill with barium.

FIGURE 1.

This photograph shows barium filling of the gall bladder (upper left) through three small fistulas passing up from the deformed duodenal cap.

The patient was given intravenous fluids, with resultant relief of dehydration and restoration of the red-cell count to normal. He took fluids well, but vomited several times, usually in large quantity. He had no pain until the night of the seventh hospital day, when he began to complain of cramping in the lower abdomen. At this time, the abdomen was soft, with loud peristaltic sounds. The temperature was 101°F. An enema produced good results and relieved symptoms temporarily. The next morning, the patient suddenly collapsed. When seen a few minutes later, he was unconscious and quite cyanotic, with a blood pressure of 40 systolic, 0 diastolic. The pulse and respirations were but slightly elevated. Examination of the chest was negative. The abdomen was soft and silent, not distended. The patient was given intravenous fluids, and transfusions of both blood and plasma. He responded within half an hour. In the course of the day, he developed increasing distention, and complained intermittently of pain in the left lower quadrant. The temperature returned to normal. The next day, there was generalized abdominal tenderness, centering in the left lower quadrant.

The patient was given constant gastric suction and intravenous fluids. He became unconscious on the evening of the ninth hospital day, and died five hours later.

DIFFERENTIAL DIAGNOSES

DR. RICHARD H. SWEET: A few comments on certain aspects of the history are in order. "Seven months before entry, the patient had a fourth attack of nausea and vomiting, this time preceded by a month of anorexia and slight weakness." This suggests something different, a new train of symptoms.

This examination showed a "filling defect at the pylorus." One wonders if the patient was not beginning to suffer from an obstructing lesion, which produced the anorexia, fatigue and, perhaps, the nausea and the loss of weight and strength.

"The pupils were wide and irregular, and reacted poorly to light and only slightly better to accommodation"; this suggests Argyll-Robertson pupils.

"The urinary bladder rose to two fingerbreadths below the umbilicus." One begins to think seriously about tabes, and the spinal-fluid findings are confirmatory.

"The prostate was twice the normal size." That might have entered into the picture. The patient might have had obstruction of the urethra because of an enlarged prostate.

He had a fairly normal temperature and a reasonably normal differential count. One might assume that he was not suffering from an inflammatory process or an acute infection. If he had a carcinoma of the pylorus, one would expect to see blood in the stools.

"Gastric aspiration produced 125 cc. of greenish, guaiac-negative fluid." Once again, doubt arises regarding the correctness of the first impression that he might be suffering from carcinoma of the stomach.

May we see the x-ray films?

DR. LAURENCE L. ROBBINS: There is quite definite thickening of the folds of the stomach, but as nearly as I can make out, this is antrum and this

represents the duodenal cap. Here, of course, is the common duct filled with barium, and here must be the gall bladder, with the cystic duct visible in this region. These spot films demonstrate the fistulous tracts between the gall bladder and the first portion of the duodenum.

DR. SWEET: Do you think the biliary system filled through the fistulas or by regurgitation through the common duct?

DR. ROBBINS: Not having seen it fluoroscopically, I do not know, but the appearance of the common duct in the distal portion is not what one sees with retrograde filling. I should guess that it had filled through the fistulas.

DR. SWEET: So that we have the problem in this case of deciding what was the cause of the fistulas. In surgical practice, one encounters relatively few causes of that condition. The commonest is ulceration from the gall bladder into the duodenum, with necrosis of a portion of the gall bladder, usually attributed to pressure from a stone in association with infection. Most of the cases of gallstone ileus result from the passage of a large stone directly from the gall bladder through this wall of the duodenum, down into the intestinal tract. This causes a large fistulous opening. Carcinoma of the gall bladder, in my experience, rarely leads to a condition such as this. Here is a fairly normal-looking gall-bladder shadow. There is a well-defined common-duct shadow, and one might exclude carcinoma arising in the region of the cystic duct. Carcinoma of the duodenum is exceedingly rare. The few that I have seen were in the third portion.

Could the fistula have been due to a syphilitic lesion? Are gummas seen in this region? If so, would a gumma produce ulceration through the duodenum and into the gall bladder? I doubt it. The patient was a Syrian. Did he have echinococcal disease? There is no evidence for it, at least no x-ray evidence, and no mention of enlargement of the liver. Echinococcal cysts that obstruct the common duct from the passage of daughter cysts down the duct are occasionally encountered. In this case, however, there was apparently no common-duct obstruction, although one cannot be sure because one does not actually see that the barium went out into the duodenum through the common duct. There was no jaundice. According to the history, I believe I can exclude echinococcal disease. No echinococcus fixation test was done.

Since I cannot answer the question about the relation of syphilis, I shall go on with this lengthy and puzzling story. I do not know why the patient died or what he had. I believe he must have had peritonitis, but how he developed it, I am sure I cannot tell. I should think that, if he had had leakage from one of the fistulas in the right upper quadrant, the tenderness would have been maximal there or in the right lower quadrant instead of the left.

What conditions give rise to peritonitis in the left lower quadrant? Of course, the organs that one finds there — the sigmoid and so forth — may be the cause. Conditions arising in the upper abdomen may include some retroperitoneal hemorrhage or evacuation of an abscess retroperitoneally from the pancreas. Fluid arising in the upper abdomen from perforation of the stomach, duodenum, gall bladder or common duct usually passes down on the right side. Of course, I cannot tell; I did not see the patient. It may have come down on the right and gone over to the left side, but I get the impression from this — whatever the sudden episode was — that he had something producing the maximum of reaction in the left lower quadrant. It is fair to assume that the patient had as a final episode a generalized peritonitis unless there was something else, like intra-abdominal hemorrhage, which one could not tell anything about from this record. The case is exceedingly puzzling. To summarize, I believe the patient had some peculiar lesion in the duodenum or gall bladder, which I suppose was the origin of the sudden abdominal catastrophe that was the cause of death.

DR. TRACY B. MALLORY: Are there any questions or suggestions?

DR. FULLER ALBRIGHT: How about a ruptured aneurysm?

DR. MALLORY: Where?

DR. ALBRIGHT: I do not know.

DR. SWEET: That is what I meant when I said "intra-abdominal hemorrhage."

DR. MALLORY: Dr. Dieuaide, how much of a role would you consider syphilis to have played in this process?

DR. FRANCIS R. DIEUAIDE: I think it probably played none. Gummas may occur in that region perfectly well, but are unusual. I do not believe, however, that a syphilitic process in this region would be likely to be associated with fistulas. The fistulous nature of the lesion is an important clue. A gummatous process here would be an adhesive, more or less solid, mass. Accordingly, I should abandon syphilis as the explanation of the lesion, although the patient certainly had central-nervous-system syphilis. I should consider it meningovascular rather than tabetic. I do not believe an aneurysm could be used to explain the whole story, although a ruptured aneurysm could be the explanation of the terminal episode.

DR. ALBRIGHT: I believe the fistula was due to stone.

DR. SWEET: That would be the most likely thing on the law of averages.

DR. ALBRIGHT: And that it had nothing to do with the final outcome.

DR. DIEUAIDE: May I ask Dr. Sweet if all this multiplicity is against stone?

DR. SWEET: That is correct. Usually, there is one fistula with stone; that is why I did not make that diagnosis.

DR. ALBRIGHT: I have seen cases with two fistulas.

DR. MALLORY: How many fistulas would you say there were here, Dr. Robbins?

DR. ROBBINS: I think there are three in the spot films.

CLINICAL DIAGNOSES

Peritonitis.
Fistulous tract between duodenum and gall bladder.

DR. SWEET'S DIAGNOSES

Cholecystoduodenal fistula (cause undetermined).
Generalized peritonitis.

ANATOMICAL DIAGNOSES

Duodenal ulcer, chronic, active, with perforation into peritoneal cavity and erosion into gall bladder, cystic duct and common duct.
Peritonitis, generalized acute.
Intrahepatic cholangitis.
Central-nervous-system syphilis, meningovascular type.

PATHOLOGICAL DISCUSSION

DR. MALLORY: At post-mortem examination, the abdomen was opened, and gas in large quantities gushed forward. Then it was apparent that there was 6000 cc. of green fluid, as well as gas, in the peritoneal cavity. This fluid smelled rather strongly of gastric contents. The explanation of all this became apparent when dissection was carried down to the region of the duodenum. Just beyond the pylorus, a very large peptic ulcer was found, which had perforated the wall of the duodenum and produced a large excavation into the surrounding structure, and from this cavity five fistulous tracts were found, three running into the adherent gall bladder, one into the cystic duct and one into the common duct. The one in the common duct was quite large, and the filling in the common duct was probably due to that rather than to the gall-bladder fistulas, although with five fistulas there was ample chance for barium to run in either direction. The crater had finally ruptured into the general peritoneal cavity, so that the gastric contents had passed freely into the peritoneal cavity, as had the total drainage of the biliary system. There was nothing to explain why the terminal symptoms were primarily in the left lower quadrant.

DR. SWEET: How common is a fistulous communication between the duodenum and the gall bladder from a peptic ulcer? I should have said it was unusual.

DR. MALLORY: It is definitely unusual; most fistulas are produced in the other fashion.

The central nervous system did show chronic meningeal infiltration and granular ependymitis quite characteristic of meningovascular syphilis. There was no evidence of tabes.

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The Journal does not hold itself responsible for statements made by any contributor.

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MEDICAL ADVISORY COMMITTEE FOR INDUSTRIAL ACCIDENT BOARD

Attention should be called to a letter published elsewhere in this issue of the *Journal*. This letter, written by the chairman of the Industrial Accident Board, announces the appointment of the Medical Advisory Committee, which is the natural outgrowth of the single medical advisers to the board, the last of whom was Dr. Francis D. Donoghue. Such action is in line with the policies first laid down by "a committee representing the medical profession," and with those subsequently developed, all of which have become "the backbone of the compensation law" in the Commonwealth. It requires little stretch of the imagination to visualize the progressive outlook and considered advances that may be expected as the result of the appointment of this medical committee. Claimants and insurance carriers will unquestionably benefit in terms of rehabilitation and the resultant easing of rates; and, most important of all, it seems possible that an ambition long held by the present chairman of the board, which envisages raising the standard of industrial medicine in this and other states, will be realized. No comment need be made of the members of the committee other than to say that they will be recognized everywhere as a judiciously minded set of physicians who represent the highest ideals in their particular branches of the profession.

The chairman and members of the Industrial Accident Board are to be congratulated for taking this significant step, and it seems likely that further equally progressive activity can be anticipated.

SHIFTING POPULATIONS

It would be as difficult as it would be fruitless to attempt to prove or disprove the engaging hypothesis that man is a sort of artifact in the universe: comparatively useless, quite unsuited to his environment, and yet amazingly tenacious. It is this stubborn tenacity that has made him clothe himself against the cold, erect shelters from the sun and the rain, exterminate most of the predatory lower animals, battle against almost overwhelming swarms of insects, exploit the vegetable kingdom for his own uses, store food in tin cans, build railroads, hotels and central heating plants, and intermittently try to club, hack or bomb his fellow man out of existence.

The hope of half the world is for more manpower to fight for larger lands on which to park its increased populations; the fear of the other half is that its population increase will slacken so much that it can no longer hold the gains it once made. The real point is that nations with increasing populations are virile; they are still "on the make." Those with declining populations are

exhausted and decadent, their powers sapped by the very security that previous generations had gained for them.

The United States, according to the Metropolitan Life Insurance Company,* has, during each year of the last decade, enjoyed an increase of about 1,000,000 persons resulting from the excess of births over deaths. The population, in other words, is still increasing quite rapidly. The crude figures of birth rates and death rates, however, do not give the true picture. This increase is due not to more births but to fewer deaths: the average age of the population is also increasing, and the population must eventually reach a standstill. The important gauge is the fertility rate, or the number of daughters born annually per thousand women within a specified age group. This rate has been steadily declining during the past twenty years. In 1920, the net reproduction rate was 1.252; in 1940, it was 1.024. When the ratio of daughters to possible mothers in an age group is unity, fertility and mortality are balanced, and a stationary population will be reached.

So far as the needs of our present situation are concerned, we may have no fear; indeed, the life-insurance statisticians assure us that we have today, of the proper age for combat or production, 2,800,000 men who would not now be alive had the mortality rate of 1900 continued to the present time. If we cannot reproduce so well as formerly, at least we can still save — up to a limit. Reserves without replacement, however, must eventually become exhausted, whether of material or of men, and although this problem will affect mainly the coming generations, it is as much ours to solve as theirs.

**Statistical Bulletin*, Metropolitan Life Insurance Company: February, 1942.

MEDICAL EPONYM

Queckenstedt Maneuver

The contribution, "Zur Diagnose der Rückenmarkskompression [Diagnosis of Spinal-Cord Compression]," from which the following extract is taken, appeared in the *Deutsche Zeitschrift für Nervenheilkunde* (**55**:325–333, 1916). The author, Hans Queckenstedt (d. 1918), was then *Privatdozent* and *Oberarzt* in the University Medical Clinic at Rostock.

> Wherever the dural tube is thus damaged, an exchange of spinal fluid between the two spaces thereby engendered is impossible. But even in lesser degrees of the condition described, the narrowing of the passageway must offer increased resistance to any movement of the fluid. Consequently, if there occurs any increase in pressure above the point of compress, the fluid either will fail absolutely to be displaced caudally or will do so with diminished rapidity, according to the degree of block. Such an increase in pressure may be effected in a simple manner, by vigorously grasping and compressing the throat either on both sides or unilaterally. The space available for the fluid is diminished from within by the excess of blood in the brain, and possibly from without as well, by the equalizing efflux of blood through the upper vertebral venous plexuses, thereby occasioning an increase in pressure, which is normally transmitted downward very quickly and reveals itself in a vertical tube attached to the lumbar-puncture needle. The beginning of the rise of the fluid in the tube follows almost immediately the compression of the neck, in less than one second, and the fluid rises very quickly with a kind of spurt until it reaches a momentary maximum. One soon acquires an idea of the normal interval after performing the test a few times. In the presence of compression, the rise is slow, and above all, the onset is delayed; frequently, it is necessary to produce marked congestion to obtain it at all, and in turn, on removal of the pressure about the neck, the pressure falls abnormally slowly or not at all.
>
> R. W. B.

MASSACHUSETTS MEDICAL SOCIETY

COMMITTEE ON MATERNAL WELFARE

Case History: Miscarriage followed by sepsis and death

A twenty-five-year-old multipara who had had no prenatal care entered the hospital after a severe fall. The past history was entirely irrelevant. Her previous pregnancy had been normal, and the child was living. At the time of entry, she was flowing, and two hours later miscarried a twelve-inch fetus. Because she had had no periods since the birth of the first baby, a year previously, and from the description of the fetus, which suggested that she was at least five months pregnant, it is very evident that pregnancy probably took place during lactation. After the fetus had been delivered, the placenta did not come away; attempts at expression were unsuccessful, and considerable bleeding resulted. A curettage was done with what was described as "a dull curette." Severe sepsis developed two days later, a culture of *Staphylococcus aureus* was obtained on the fourth day, and death occurred on the eighth day following delivery.

Comment. Curettage in a case so far advanced in pregnancy as this one is a questionable procedure. Whether or not the uterus should have been invaded at all depends on the degree of bleeding. If the bleeding was not excessive, small doses of pituitary extract might have been effective; if the bleeding was excessive, the uterus of course should have been invaded and an attempt made to remove the placenta manually. If the placenta was found to be adherent and the line of cleavage not easily attained, so that the placenta was removed piecemeal, packing the uterus for twenty-four hours would have controlled the bleeding and possibly effected the separation and evacuation of the rest of the placenta. Even when it is known that pieces of the placenta have been left behind, a curettage is not the proper procedure. There is no evidence that chemotherapy or immune transfusions were attempted.

It is interesting that the flowing started following a severe fall. Surely, most pregnant women fall at some time or other during their pregnancy, and if they miscarried as a result, the birth rate would be almost nil. In this case, however, since the flowing started so soon after the fall, it must be concluded that the fall was a causative agent and that the two were not merely coincidental.

DEATHS

MAGUIRE — James A. Maguire, M.D., of Atlantic, died May 31. He was in his thirty-seventh year.

Dr. Maguire received his degree in 1931 from Tufts College Medical School, where he was assistant in medicine from 1938 to the time of his death. He was a member of the Massachusetts Medical Society and the American Medical Association.

McBAIN — William H. McBain, M.D., of Malden, died May 9. He was in his sixty-ninth year.

Born in New York City, Dr. McBain received his degree from Harvard Medical School in 1901, and later did postgraduate work in Dublin and Vienna. A former member of the staff of the Malden Hospital, he was a member of the New England Obstetrical and Gynecological Society, and a fellow of the Massachusetts Medical Society and the American Medical Association.

His widow and a son survive him.

WAR ACTIVITIES

CIVILIAN DEFENSE

OCD Urges Recruitment of More Nurses' Aides

The Civilian Mobilization Branch of the United States Office of Civilian Defense recently issued a memorandum to its regional representatives urging a concerted effort to stimulate the recruitment and enrollment of nurses' aides to relieve the serious shortage of nursing personnel in hospitals.

A report dated June 20 showed that 25,905 nurses' aides had been enrolled, of whom 12,890 had been certificated. This is only one fourth of the 100,000 set as a goal at the beginning of the campaign in the summer of 1941. Reports from all parts of the country indicate that the training has been well carried out and that the nurses' aides are now giving valuable service in their assignments.

The memorandum reveals that some hospitals are reported to be accepting volunteer workers without training and permitting them to carry out many of the tasks usually performed by nurses' aides. Although several different types of volunteer assistants can be used in hospitals, untrained workers should not be assigned to duties similar to those of trained nurses' aides. Such a practice militates against the establishment of a reliable, disciplined corps of workers and deters enrollment of nurses' aides.

The Medical Division issued a similar memorandum to regional medical officers, pointing out the danger of allowing untrained workers to give service to patients and the handicap to recruitment of students for the nurses-aide course.

"It is understandable that hospitals short of workers want help as soon as possible, but the relatively short time necessary for training nurses' aides usually repays the hospital for waiting because it assures more dependable and disciplined workers," the memorandum said. "If volunteers are allowed to work on hospital wards without training and are assigned duties similar to those performed by trained nurses' aides, there is a serious effect on recruitment of nurses' aide students."

Nurses' aides are recruited by the American Red Cross in co-operation with local civilian-defense volunteer offices. Each local chapter of the Red Cross that sponsors nurses-aide training has a nurses-aide committee on which there is a representative of the local civilian-defense volunteer office. The local chief of emergency medical service is also a member of this committee, which recruits desirable applicants, selects hospitals to serve as training centers, and organizes and maintains a placement service for aides who have completed their courses.

The training course for nurses' aides includes eighty hours of instruction presented in seven weeks. The first half is given in a Red Cross chapter house or other suitable place. After this probationary period, the instruction is continued in hospitals selected as training centers. When the course is completed, the Red Cross serves as a placement agency for the assignment of nurses' aides to duty in hospitals, clinics, health departments, and school-health and field-nursing services.

To permit certain exceptions, the Red Cross recently modified its requirement that all hospitals selected as training centers for nurses' aides must be on the approved lists of the American Medical Association and the American College of Surgeons. Before the local nurses-aide committee approves a request for an exception, it must obtain the following information: why the hospital is not approved by the American College of Surgeons; its standing in the local community; the bed capacity; the daily average number of patients; how many graduate nurses are employed; whether there are graduate nurses on all floors to provide adequate supervision; how many paid aides are employed; the possibility of providing practice for the second part of the course and opportunity for service later; and the need for volunteer nurses' aides in the community. If the nursing standards are high, if the hospital in question is not on the approved list of the American College of Surgeons owing to lack of equipment that has no connection with the training of nurses' aides and if the area Red Cross nursing supervisor confirms the recommendation of the local committee, the hospital may be approved as a training center. In case there is no

nurses-aide committee, a Red Cross nursing consultant may visit the hospital, or information may be obtained from the state nursing council or the state nurse-examining board.

Each nurses' aide agrees to give one hundred and fifty hours of service in each calendar year, preferably within a three-month period. In case of need for war service, nurses' aides must be prepared to serve locally in the emergency for as long as they are needed.

The Office of Civilian Defense has asked its regional-office representatives to work out plans for stimulating the recruitment of nurses' aides to provide the needed strength to meet war demands. These plans are to be put into effect through the officially constituted authorities, including state and local chiefs of emergency medical service, their nurse deputies, local Red Cross chapters and local civilian-defense volunteer offices.

Without the assistance of large numbers of nurses' aides to supplement the registered nurses, many hospitals report that they would be unable to provide adequate nursing services. If coastal and industrial cities are subjected to enemy attack, the need for nurses' aides will be greatly accentuated. The goal of 100,000 trained nurses' aides must be reached, the Medical Division declares. In no other branch of service can women be of greater value to the war effort.

CORRESPONDENCE

MEDICAL ADVISORY COMMITTEE FOR INDUSTRIAL ACCIDENT BOARD

To the Editor: When the Massachusetts Workmen's Compensation Act became a law, a committee representing the medical profession met and discussed the important medical aspects of such an act; at the meeting, this committee established a few fundamental policies which were adopted by the Industrial Accident Board and became the backbone of the compensation law. These policies have developed and grown as a result of the continued advice and study by representatives of the medical profession as a whole.

I believe that the success of the Industrial Accident Board in Massachusetts, and its high standing in other states, is due in a considerable degree to the assistance we have received from many members of the medical profession recognized as specialists in their respective lines of work.

It is the desire of the Board to continue this policy and, although many are well qualified throughout the Commonwealth to serve the Board in an advisory capacity, it is expedient and desirable that such a committee be located near the offices of the Board.

I am, therefore, pleased to announce the appointment of the Medical Advisory Committee as follows:

Dr. Cadis Phipps, chairman, 587 Beacon Street, Boston. Director, First and Third Medical Services, and physician-in-chief, Third Medical Service, Boston City Hospital; professor of medicine and head of Department of Medicine, Tufts College Medical School; diplomate, American Board of Medicine.

Dr. William E. Browne, secretary, 587 Beacon Street, Boston. Associate, Surgical Staff, Beth Israel Hospital; surgeon-in-chief, Second Surgical Service, Carney Hospital; clinical professor of surgery, Tufts College Medical School; fellow, American College of Surgeons; diplomate, American Board of Surgery.

Dr. Donald Munro, Boston City Hospital, Boston. Surgeon-in-chief for neurological surgery, Boston City Hospital; associate professor of neurological surgery, Boston University School of Medicine; assistant professor of neurological surgery, Harvard Medical School; member, American Neurological Association, New England Surgical Society and Society of Neurological Surgery; fellow, American College of Surgeons; diplomate, American Board of Neurological Surgery and American Board of Surgery.

Dr. William A. Rogers, 266 Beacon Street, Boston. Instructor in orthopedic surgery, Harvard Medical School; member, American Orthopedic Association; fellow, American College of Surgeons; diplomate, American Board of Orthopaedic Surgery.

Dr. John G. Downing, 520 Commonwealth Avenue, Boston. Assistant dermatologist, Boston City Hospital; assistant professor of dermatology, Tufts College Medical School; consultant, United States Public Health Service; member, Boston Health Department, American Academy of Dermatology and Syphilology (vice-president), American Association of Industrial Physicians and Surgeons, American Dermatological Association, Society of Investigative Dermatology and New England Dermatological Society; diplomate, American Board of Dermatology and Syphilology.

Dr. Arial W. George, 43 Bay State Road, Boston. Member, American Roentgen Ray Society, British Institute of Radiology, New England Roentgen Ray Society and Radiology Society of North America; diplomate, American Board of Radiology.

Dr. Timothy Leary, 43 Bay State Road, Boston. Medical examiner, Suffolk County; professor of pathology, emeritus, Tufts College Medical School; lecturer in legal medicine, Harvard Medical School.

These men are recognized as specialists by members of their profession and, I believe, will render invaluable service to the Commonwealth.

EMMA S. TOUSANT, *Chairman*
Industrial Accident Board

State House
Boston

DEATH RATE IN INFANCY AND CHILDHOOD

To the Editor: The editorial that appeared in the July 9 issue of the *Journal* on the subject, "Death Rate in Infancy and Childhood," has been the subject of discussion among the members of our division staff.

We have read the article by Dublin and Spiegelman therein quoted. The three years chosen for the study include the very last of the years (1937) when the Massachusetts' infant mortality rate was above 40. In the remaining two years, 1938 and 1939, the rate was below 40, and it has continued to decrease. The rates for these years are as follows: 1937, 43.8; 1938, 39.1; 1939, 37.4; 1940, 37.5; and 1941, 35.3.

We fully appreciate the problems presented by the unusual conditions of the present and the future and shall do our utmost to "hold fast to the ground that has already been gained." To that end we feel sure we may call on the continued co-operation of the medical profession in Massachusetts.

FLORENCE L. MCKAY, M.D., *Assistant Director*
Division of Child Hygiene

73 Tremont Street
Boston

WILLIAM HENRY WELCH

To the Editor: The excellent editorial on William Henry Welch in the July 23 issue of the *Journal* reminds one of the esteem shown him by his associates. I recall walking the hospital wards with Dr. Osler in the early days of Hopkins. Discussing a medical problem, Dr. Osler inquired, "Well, what does the king of all pathologists say to this?"

A present-day visitor to the school is struck by the inscription across the façade of the Anatomical Building, "The Woman's Fund Memorial Building, 1894." This marks an end to the long struggle to raise sufficient money to warrant opening the school. A group of women, with the timely help of Miss Mary Garrett, offered the University a fund of half a million dollars on the conditions that women should be admitted on the "same terms" as men and that the entrance requirements should be on a university level.

Some years later, Dr. Welch, speaking at the annual meeting of the Association of American Universities on "Women in Medicine," said: "The faculty of Hopkins deserves little credit for the success of the school. Only Osler, Kelly and Hurd signed a letter of acceptance to the proposition of the women; the rest of us were frankly skeptical about the experiment of coeducation. Now, after the actual experience, I am sure that I report my colleagues correctly that we would unanimously vote to continue coeducation in the medical school." That medical education belongs to a university and that women are to participate in the intellectual aspect of medicine mark an epoch in American medicine.

Among the treasures also to be seen by the visitor, is the Sargent group of the "Great Four." Of Dr. Welch sitting in front, Dr. Osler once remarked, "One sees his strength as an aura."

SARAH ELLEN PALMER

186 Commonwealth Avenue
Boston

REPORT OF MEETING

HARVARD MEDICAL SOCIETY

A regular meeting of the Harvard Medical Society was held at the Peter Bent Brigham Hospital on April 14, with Dr. C. Sidney Burwell presiding. There was a case presentation by the medical service.

A sixty-four-year-old man was first admitted in 1940 because of asthmatic breathing of eighteen months' duration. Physical examination was essentially negative except for the liver, which could be palpated 4 cm. below the right costal margin. There were no significantly enlarged lymph nodes, and the spleen was apparently normal. The red-cell count was 4,800,000, and the white-cell count 11,000 with a normal blood smear. In December, 1941, the patient returned because of a loss of 15 pounds in weight, weakness and gaseous eructations. Physical examination revealed an enlarged liver and a palpable mass in the left upper quadrant. This finding was confirmed by x-ray studies as the spleen; no gastrointestinal defects were demonstrable. On admission to the medical service two weeks later, the patient was found to have a considerable amount of fluid in the left pleural cavity and generalized lymphadenopathy, as well as hepatomegaly and splenomegaly. The white-cell count was 126,000 with 93 per cent large lymphocytic cells. One thousand cubic centimeters of fluid was removed from the left pleural cavity. After three spray treatments of x-rays of 50 r each, directed from the chin to the knees, there was within twelve days a decrease in the white-cell count to 13,000. The percentage of lymphocytes remained about the same. Two months later, there was great subjective improvement, and the leukocyte count was 5000; three months later, the white-cell count was 7000, with 50 per cent polymorphonuclear neutrophils.

In the discussion, Dr. William Dameshek questioned whether regional roentgen-ray therapy is not better for decreasing the white-cell count and increasing the red-cell count. Dr. M. C. Sosman stated that much better results are obtained with spray therapy using small dosage. There is apparently less systemic reaction, and the erythrocyte count rises more gradually and is longer sustained. Regional roentgen-ray therapy is now used by him only for the alleviation of subjective local signs.

The speaker of the evening was Dr. Louis Hamman, of Johns Hopkins University School of Medicine, who discussed "The Diagnosis of Leukemia." This disease is now better known for its bizarre onset in many cases than was formerly noted. A patient may present anything from a peridental abscess or tachycardia to change of bowel or urinary habits. Any of the bodily systems may supply the initial symptom. There is one group in which the early blood picture fails to reflect the true state of affairs, and these conditions are therefore particularly difficult to detect. Another recent development that complicates the diagnosis of leukemia is the recognition of so-called "leukemoid reactions," which result in almost identical hemograms. These may be the result of: irritation or stimulation of the bone marrow, such as that in osteomyelitis and other infections, complicated fractures, metastatic cancer completely replacing the active marrow and leading to the establishment of other foci of hematopoiesis, Hodgkins's disease and benzol poisoning, which may eventually be exactly the same and has been suggested by some as an etiologic factor; a marrow response to regeneration, as in the acute familial hemolytic jaundice, severe hemorrhage, agranulocytosis and severe infections; and "myelophthisis," a condition in which ectopic foci of hematopoiesis arise in the primitive blood-forming organs when the marrow is inadequate because of such conditions as osteosclerosis and fibrosis, extensive tumors and the late stages of increased demands on the regenerative system. In the first group, the leukocyte count may be very high, and there is usually marked eosinophilia and immaturity of the leukocytes. In the second group, there is only moderate leukocytosis and immaturity and less eosinophilia. In the last group, the leukocyte count may be anything, but there is often increased immaturity of cells, whereas eosinophilia is not common.

In the diagnosis of leukemia, one should be careful not to include any of the above conditions, especially those with a favorable prognosis, for there is nothing worse than to have a family prepared for an inevitable death that fails to materialize. When leukocytosis and immature white cells are present, the diagnosis of leukemia is not difficult. But this cannot be said of the subleukemic, aleukemic and leukopenic stages. In true leukemia, there is always — except perhaps during remissions — some degree of anemia, which may be pronounced too severe, with an increase of normoblasts. The platelets are invariably very low. Immaturity of leukocytes occurs in about 90 per cent of the cases, and the cells are often atypical. Various cell families may sometimes be differentiated only by mobility tests.

Dr. Hamman cited some case histories to indicate the

problems involved. In one, a seventy-five-year-old man had pericarditis with effusion and no demonstrable blood change for several months. Therefore, a patient may have leukemia for some time without blood changes, and certain diseases may terminally become leukemia. Another case of the same type had symptoms without recognizable changes of the hemogram for four months: a middle-aged woman had recurring fever, with two positive agglutination tests for *Brucella mellitensis*, and tubercle bacilli were cultured from a lymph node before the blood picture became that of leukemia. At autopsy, all organs revealed typical findings of leukemia, but of the more acute type. However, a review of blood smears revealed that there was an early anemia and granulopenia and that the 90 per cent of the "lymphocytes" were in reality myelocytes and myeloblasts. Subsequent smears showed an accentuation of all features of a true leukemia. Clinically, it was concluded that the patient had had this disease from the beginning, with intercurrent Malta fever and localized tuberculosis, but the pathologist stated that the course could not have been of seven months' duration. This raises the question whether leukemia may result from stimulation by poisons, infections and so forth. Malta fever is known to occasion leukemoid reactions.

Another case was that of a fifty-nine-year-old man who was suspected of having a duodenal ulcer but had roentgenologic evidence of it for only a short while. On developing signs and symptoms of a perforation, the patient was subjected to an operation, but no ulcer was found. During and after the convalescence, the pain continued and became severer until it was almost unbearable. Roentgenograms revealed what appeared to be multiple bone metastases, and some slight relief resulted from irradiation therapy. On admission, the blood picture was normal, but the erythrocyte count soon fell, whereas that of the leukocytes rose and more immaturity of these cells became apparent in blood smears. Autopsy a few weeks later revealed characteristic leukemia, the cause of sudden death being a subarachnoid hemorrhage — not a rare occurrence.

In conclusion, Dr. Hamman stated that leukemia may be present for some time with signs and symptoms but no characteristic blood changes, just as well as the opposite. In children, it is likely to simulate acute infections, whereas in adults chronic infection and cancer are usually suspected.

The discussion was opened by Dr. E. A. Stead, Jr., who emphasized the fact that myelocytes are frequently called lymphocytes in unknown smears. Dr. Chester S. Keefer asked whether leukemia might not be caused by multiple small doses of irradiation. Dr. Louis K. Diamond pointed out the difficulties in children, in whom infection so often elicits a bizarre blood response. More than 50 per cent of his leukemic patients were in the leukopenic stage on admission, and biopsy is, therefore, often used. Signs and symptoms of rheumatic fever are fairly common and are always associated at the onset with relatively low leukocyte counts. The importance of thrombocytopenia as a diagnostic aid was emphasized.

In answer to a question by Dr. Sosman on how best to treat early cases when the total white-cell count is essentially normal, but the percentage of young forms is high, Dr. Hamman stated that irradiation therapy may actually be harmful and should be reserved for the onset of symptoms. Temporarily, supportive treatment should be employed.

BOOK REVIEW

Behind the Mask of Medicine. By Miles Atkinson, M.R.C.S., L.R.C.P. 8°, cloth, 348 pp. New York: Charles Scribner's Sons, 1941. $3.00.

This book, like those of "The Doctor Looks at ——" sort, is designed for lay consumption. It contains some history and considerable philosophising concerning the relation of the patient to the doctor, medical economics and the present and potential status of medical practice.

Dr. Atkinson is fluent, sometimes thought provoking, and not infrequently amusing. But the title of the book, connoting as it must in some minds something camouflaged or deliberately concealed, is inappropriate and unfortunate. Moreover, the author is sometimes just a little too glib, a shade too cocksure. His insouciance is the more conspicuous in the face of certain careless errors and misleading implications. It is not true, for example, that vitamin E is "the latest of the vitamin discoveries." It is not true that a blood count is "the only laboratory procedure which is absolute." The statement that "some small boys keep for preference their testicles high up out of the way where they do not develop properly" will not have much meaning for most readers. Furthermore, Christopher Wren is hardly to be bracketed with Francis Bacon and Sir Isaac Newton as a motivating force in seventeenth-century science.

This is not meant for captious criticism; it is simply that carelessness about minutiae tends, even with some injustice, perhaps, to break down an author's credit with those in the know. Dr. Atkinson has some chapters that are quite free from either factual blemishes or "wisecracks"; the chapter on the plight of the hospitals deserves every doctor's, every hospital director's and every trustee's reading. That the chapters on socialized medicine and the future will provoke controversy is inevitable, — those are controversial subjects, — but nothing against the author.

All in all, it is a book to be read with a certain added salinity of the reader's seasoning — a good dose of salt, in spots. If one knows how to add it, well and good; if he has any doubts how, it would be wiser to let it alone.

NOTICES

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING SUNDAY, AUGUST 16

MONDAY, AUGUST 17

12:15–1:15 p.m. Clinicopathological conference. Peter Bent Brigham Hospital amphitheater.

TUESDAY, AUGUST 18

12:15–1:15 p.m. Clinicoroentgenologic conference. Peter Bent Brigham Hospital amphitheater.

WEDNESDAY, AUGUST 19

*12:00 m. Clinicopathological conference. Children's Hospital.

*Open to the medical profession.

SEPTEMBER 9–12. American Congress of Physical Therapy. Page x, issue of May 14.

SEPTEMBER 29, 30 AND OCTOBER 1. Connecticut Clinical Congress. Yale Law School Building, New Haven, Connecticut.

SEPTEMBER 30–OCTOBER 10. Conference and Course in Legal Medicine. Page ix, issue of July 23.

OCTOBER 12–23. 1942 Graduate Fortnight. New York Academy of Medicine. Page xi, issue of May 21.

OCTOBER 14–17. American Academy of Physical Medicine. Hotel Statler, Boston.

OCTOBER 19–23. 1942 Clinical Congress of the American College of Surgeons. Page ix, issue of February 5.

(Notices continued on page ix)

FEBRUARY 13. American Board of Obstetrics and Gynecology. Page ix, issue of July 2.
APRIL 12–16. American College of Physicians. Page x, issue of July 16.

DISTRICT SOCIETIES

BRISTOL SOUTH
DECEMBER 3. Fall River.
MAY 6. New Bedford.

FRANKLIN
SEPTEMBER 8.
NOVEMBER 10.
JANUARY 12.
MARCH 9.
MAY 11. Annual meeting.
All meetings are held at 11:00 a.m. at the Franklin County Hospital, Greenfield.

PLYMOUTH
OCTOBER 15. Moore Hospital.
NOVEMBER 19. Plymouth County Hospital.
JANUARY 21. Brockton Hospital.
FEBRUARY 18. Jordan Hospital, Plymouth.
MARCH 18. Goddard Hospital.
APRIL 15. Bridgewater State Farm.
MAY 20. Lakeville.

WORCESTER
SEPTEMBER 9. Belmont Hospital, Worcester.
OCTOBER 14. Rutland State Sanatorium, Rutland.
NOVEMBER 11. Grafton State Hospital, North Grafton.
DECEMBER 9. Worcester City Hospital, Worcester.
JANUARY 13. St. Vincent Hospital, Worcester.
FEBRUARY 10. Worcester State Hospital, Worcester.
MARCH 10. Memorial Hospital, Worcester.
APRIL 14. Hahnemann Hospital, Worcester.
MAY 12. Annual meeting.

WORCESTER NORTH
OCTOBER 28.
JANUARY 27.
APRIL 28.
JULY 28.

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CARDIOLOGY
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October 7–December 30
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MEDICAL DIAGNOSIS and TREATMENT
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